Vol. 1070 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

IN THIS ISSUE

U.S. PATENT NO. 4,613,269

THE ONE-MILLIONTH PATENT PRODUCED THROUGH THE PATENT DATA BASE AND PRINTING SYSTEM

PATENTS

September 23, 1986

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
September 23, 1986 Volume 1070 Number 4

THE ONE-MILLIONTH PATENT PRODUCED THROUGH THE PATENT DATA BASE AND PRINTING SYSTEM

PATENT 4,613,269

On Aug. 4, 1970, the Patent and Trademark Office issued the first patent produced under a new printing technique. Under this system, a key-stroked magnetic tape, used to drive a photocomposition device, also served to begin a full text patent data base. On Sept. 23—16 years, one month and 19 days later—the one millionth patent will issue under this system.

In these 16 years we have made giant strides toward automating the Patent and Trademark Office. The full text patent data base created as part of the new printing system has become a key element in this effort. Only recently, years of planning came to fruition when we initiated the test bed for automation of the patent examining process.

These developments come at a time when the value of the patent system is gaining wider and wider recognition. This renewed strength is evidenced, for example, in the explosive growth of patents in the biotechnology field.

As President Reagan has stated:

> "Throughout our nation's history the patent system has played a critically important role in stimulating technological advances."

At this time when unprecedented national and international attention is being focused on the importance of protection for intellectual property, we at the Office have rededicated ourselves to improving the quality of the agency's products while continuing efforts to provide faster service to the public.

The anniversary we are observing is a reflection of these improvements. I am confident that there will be many more in the future.

Donald J. Quigg
Assistant Secretary
and Commissioner of
Patents and Trademarks

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 23, 1986 Volume 1070 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1070 OG 32
Notice of Maintenance Fees Payable	1070 OG 32
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1070 OG 33
Reissue Applications Filed	1070 OG 33
Erratum	1070 OG 33
Requests for Reexaminations Filed	1070 OG 33
Expedited Service for Certified Copies of Trademark Registrations	1070 OG 33
Service by Publication	1070 OG 34
Trademark Applications—Final Rule	1070 OG 34
Patent Certificates of Correction	1070 OG 37
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1070 OG 38
Condition of Patent Applications	1070 OG 39
Reexaminations	1419
Reissue Patents Granted (32,249)	1423
Patents Granted	
General and Mechanical (4,612,672)	1427
Chemical (4,613,332)	1659
Electrical (4,613,727)	1769
Design Patents Granted (285,740)	1859
Index of Patentees	PI 1
Indices of Reissue, Reexamination and Design	PI 51
Classification of	
Patents (Including Reissues and Reexaminations)	PI 55
Designs	PI 58
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 59
Designs	PI 60
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Sept. 20, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,404,687 through 4,406,020
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 6, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,337,575	06/229,623	7/06/82
4,337,578	06/244,243	7/06/82
4,337,645	06/216,074	7/06/82
4,337,706	06/215,760	7/06/82
4,337,723	06/216,287	7/06/82
4,337,736	06/264,024	7/07/82
4,337,767	06/225,210	7/06/82
4,337,804	06/225,693	7/06/82
4,337,812	06/230,527	7/06/82
4,337,924	06/273,593	7/06/82
4,337,938	06/241,151	7/06/82
4,337,949	06/226,910	7/06/82
4,337,957	06/216,773	7/06/82
4,337,984	06/222,051	7/06/82
4,338,016	06/278,723	7/06/82
4,338,017	06/223,692	7/06/82
4,338,022	06/218,846	7/06/82
4,338,040	06/230,128	7/06/82
4,338,070	06/215,881	7/06/82
4,338,103	06/219,255	7/06/82
4,338,105	06/290,356	7/06/82
4,338,156	06/254,862	7/06/82
4,338,167	06/248,319	7/06/82
4,338,168	06/233,516	7/06/82
4,338,185	06/222,129	7/06/82
4,338,207	06/235,256	7/06/82
4,338,285	06/256,685	7/06/82
4,338,289	06/291,713	7/06/82
4,338,331	06/223,798	7/06/82
4,338,353	06/222,088	7/06/82
4,338,359	06/243,752	7/06/82
4,338,382	06/242,815	7/06/82
4,338,407	06/239,846	7/06/82
4,338,414	06/229,369	7/06/82
4,338,415	06/229,400	7/06/82
4,338,416	06/229,401	7/06/82
4,338,442	06/254,567	7/06/82
4,338,466	06/250,366	7/06/82
4,338,549	06/237,848	7/06/82
4,338,658	06/263,430	7/06/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,289,880, Re. S.N. 891,402, Filed July 25, 1986, Cl. 544/103, CATIONIC OXAZINES DYES, Peter Moser, Owner of Record: *Inventor,* Attorney or Agent: Karl F. Jorda, et al., Ex. Gp.: 129

4,305,027, Re. S.N. 873,127, Filed June 11, 1986, Cl. 318/439, MULTIPLE WINDINGS ELECTRICAL MACHINES, John T. R. Wilson, Owner of Record: *Inventor,* Attorney or Agent: Robert A. Green, Ex. Gp.: 212

4,473,676, Re. S.N. 862,346, Filed May 12, 1986, Cl. 524/32, POLYMER COMPOSITIONS HAVING LOW COEFFICIENT OF FRICTION, David J. Steklenski, Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Joshua G. Levitt, Ex. Gp.: 153

4,492,382, Re. S.N. 818,183, Filed Feb. 13, 1986, Cl. 277/12, REFRACTORY FIBER LADLE PREHEATER SEALING RINGS, Mack A. Hounsel, Owner of Record: *T. J. Thorpe Co., Houston, Tex.,* Attorney or Agent: B. R. Pravel, et al., Ex. Gp.: 246

4,524,619, Re. S.N. 859,476, Filed May 2, 1986, Cl. 73/505, VIBRATORY ANGULAR RATE SENSO R SYSTEM, Juergen Staudte, Owner of Record: *Piezoelectric Technology Investors, Ltd., Laguna Hill, Calif.,* Attorney or Agent: Harold C. Hohbach, et al., Ex. Gp.: 265

4,525,736, Re. S.N. 880,376, Filed June 30, 1986, Cl. 358/28, SELECTIVE COLOR MODIFICATION, Nathaniel I. Korman, Owner of Record: *Dubner Computer System, Inc., Paramus, N.J.,* Attorney or Agent: Robert S. Hulse, Ex. Gp.: 262

Erratum

"The notice of Reissue Application Filed in regard to Patent No. 4,226,897, Re. S.N. 355,202, published in the June 29, 1982 Official Gazette (1019 OG 50) should be deleted since no Reissue was filed."

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Expedited Service for Certified Copies of Trademark Registrations

On Oct. 4, 1986, expedited service for obtaining certified copies of trademark registrations will be available to the public. The cost of obtaining a certified copy showing title and/or status will be $10.00 plus $25.00 for the expedited service for a total of $35.00 per copy; a certified copy of the registered mark, not showing title or status, will be $5.00 plus $25.00 for expedited service for a total of $30.00. Requests received in the Post-Registration Section of the Trademark Services Division, Crystal Plz. 2–4C24, before 12:00 noon on U.S. Patent and Trademark Office scheduled work days will be filled within three work days.

Requests for expedited service which are hand carried to the Post-Registration Section located in Crystal Plz. 2–4C24 will be available for pickup at the same location after 12:00 noon three work days later. Requests for expedited service which are mailed to the Patent and Trademark Office will be processed and mailed back to the requester three work days after they are received in the Post-Registration Section from the U.S. Patent and Trademark Office mail room. All requests for expedited service will be machine stamped when received in the Post-Registration Section and machine stamped upon completion by the Post-Registration Section.

Anyone requesting expedited service will be limited to five registration numbers per day. Limits on the number

of registrations being certified are needed in order to ensure that service is not disrupted for routine requests for certified copies. The guarantee of service in three work days is based on the ability of the Post-Registration Section to process up to 1,000 expedited copies out of an average of 16,000 copies processed each year.

Inquiries about the service should be addressed to:

Patricia M. Davis
Administrator for Trademark Operations
Trademark Examining Operation
Crystal Plz. 2–3C06
(703) 557-3268

MARGARET M. LAURENCE,
Aug. 19, 1986 *Assistant Commissioner for Trademarks.*

Service by Publication

A petition to cancel each the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

San Francisco Shirt Works, Inc., San Francisco, Calif., Reg. No. 1,187,760, for the mark "SHIRT WORKS", Canc. No. 15,142.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of suc proceeding sent to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date ofthis publication, judgment will be entered against registrant and said registration will be cancelled.

The Realty Group, Inc., Memphis, Tenn., Reg. No. 1,182,404, Canc. No. 15,115.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Department of Commerce
Patent and Trademark Office
37 CFR Part 2
[Docket No. 60729–6129]
Trademark Applications

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.

Summary: The Patent and Trademark Office is amending the rules of practice in trademark cases to revise and clarify the requirements for drawings, to revise the requirements that an application must meet to receive a filing date, to revise the requirements for specimens submitted in connection with applications for service marks not used in printed or written form, and to abolish the practice of accepting informal drawings. The amendments are needed to reduce the computer system storage space required for drawings; to insure that all applications which are filed can be searched under the automated search system; to insure that drawings can be faithfully reproduced by photocomposition techniques; and to codify the existing practice in accepting audio cassette tape recordings as specimens in connection with sound mark applications.

Effective Date: Sept. 22, 1986.

For Further Information Contact: Ellen J. Seeherman by telephone at (703) 557–7464 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Amendments to §§2.21, 2.52 and 2.58 and the removal of §2.54 were proposed in a rulemaking notice published in the **Federal Register** on Aug. 1, 1984 at 49 FR 30749 and in the *Official Gazette* of Sept. 4, 1984 at 1046 O.G. 5. Interested parties were requested to submit written comments on or before Oct. 30, 1984. Written comments were submitted by four individuals, one company and two organizations.

Section 2.21(a)(3) is being amended to ensure that only applications which include a drawing of satisfactory reproduction characteristics, as defined in §2.52, will be accorded a serial number and filing date.

Section 2.52(a) and (b) are being amended to add clarifying language, but the reproduction standards of these sections have not been changed. Section 2.52(c) is being amended to limit the size of drawings to ensure that drawings submitted by applicants can be reproduced in the Official Gazette, on the certificate of registration and in the automated search system without the loss of detail that would occur if the drawings had to be reduced by the Patent and Trademark Office. Section 2.52(e) is being amended merely to reinforce the requirement of §2.52(a) that lines must not be fine or crowded.

Section 2.54 is being removed to abolish the practice of accepting informal drawings and thereby ensure that only applications with drawings of satisfactory reproduction characteristics for viewing on computer terminal display screens will be accorded a serial number and filing date.

Section 2.58(b) is being amended to reflect the current practice of the Office to accept audio cassette tapes as specimens of service marks not used in printed or written form.

Two commenters expressed unequivocal support for the proposed amendment to Rule 2.58, which the other commenters did not refer to this particular revision.

One commenter approved the proposed amendment to Rule 2.52, while two others questioned the clarity of the rule. One of these inquired whether Bristol board paper would still be considered acceptable for drawings. While Bristol board would be acceptable, it was not considered necessary to modify the rule to specifically refer to this type of paper since it is accepted under the current practice even though it is not specifically mentioned in the current rule. The second commenter indicated that clarification was necessary as to whether stippling or lining for shading is permitted. This suggestion has not been adopted because the proposed amendment specifically refers to color lining and lines used for shading. This same commenter also objected to the size limitation because detail may be lost. The commenter has suggested that the size of the drawing be increased to the maximum size compatible with the Patent and Trademark Office's automated equipment. This suggestion has not been adopted because the drawings must be of a reduced size in order to appear in the Official Gazette and on the certificate of registration. As the commenter has pointed out, reduction of a drawing may result in loss of detail,

and it is thought preferable for the applicant to determine which detail should be eliminated and still retain the commercial impression of the trademark rather than having the Patent and Trademark Office arbitrarily reduce the drawings and perhaps eliminate detail important to the applicant.

All of the commenters expressed concern with the proposed revision to Rule 2.21. Several referred to the loss of rights under section 44(d) of the Lanham Act if a filing date were to be denied because of an unacceptable drawing. Another commenter stated that U.S. applicants wished to get their applications on file as quickly as possible, and to do this preferred to send a photograph of their mark rather than take the time to have a drawing prepared. In connection with these objections, the commenters expressed concern about the uncertainty about whether a filing date would be awarded, and long delays before applicants would be notified about rejections of informal drawings.

The Office's experience with examining applications as to whether they meet the requirements for receiving a filing date should alleviate these concerns. Under the current practice, Rule 2.21(c) provides that papers which do not satisfy the requirements of 2.21(a) are returned to the applicant. Office experience over the past three years, the period this rule has been in effect, shows that a determination that the papers are informal and the return of the papers occurs between 2 and 5 days of the date the papers are submitted. It is believed that this procedure will not harm applicants filing pursuant to the provisions of Section 44(d) or domestic applications. Section 44(d) applicants have six months from the filing of their foreign application to file a formal U.S. application. In order to ensure that their drawings are acceptable under the proposed rule, they need file them only a few weeks before the six month period expires. Since the right of priority provides an effective filing date as of the filing of the foreign application, even if the application had to be resubmitted because of a defective drawing the effective filing date would remain the same. As for domestic applicants, it is recognized that the Office examines applications in the order in which they are received; that where there are conflicting applications, it is the application with the earliest effective filing date which is allowed; and that a registration on the Principal Register is prima facie evidence of registrant's use of the mark shown therein for the goods or services specified in the registration from the filing date of the application which matured into the registration. However, it is believed that any disadvantage faced by a particular applicant whose filing date is delayed as a result of the rule of the rule amendments are outweighed by the benefits to the trademark system, the public and the Patent and Trademark Office in having a system where all marks can be searched.

Several commenters suggested an alternative procedure to the proposed rule, whereby applications with defective drawings would be given a filing date, but the applicant would have 30 days from the notification of the defect, or 60 days from the filing of the application, whichever is longer, to submit an acceptable drawing. This suggestion cannot be implemented because such marks would be unavailable in the automated search system when examining attorneys and the public require this information for searches. Currently, examining attorneys are performing searches on applications in less than 60 days, and the expectation is that this time will be further reduced. If these defective special form drawings are not available on the automated search system, examining attorneys will be unable to cite them as prior pending applications. The suggested alternative would also cause a disservice to the public, for even if copies of the defective drawings were placed in a paper file for searching, it would be a burden to hunt through a 60-day accumulation of these papers which personnel cost considerations would prevent being separated by subject matter and class.

Several commenters stated a fear of overzealous enforcement of the amended rules, with marks being excluded from the trademark registration system because of technicalities. One commenter suggested that the test for holding the application informal be whether or not the applicant had made a bona fide attempt to comply with the rule. To allay these concerns the rule is being amended to require "substantial" compliance with §2.52. The Office will make every effort to interpret the rule sensibly, and will accord an application a filing date as long as the drawing meets the size restrictions and consists of black lines on white paper, without gray or half tones. Detailed procedures and guidelines for the Office's clerical personnel should ensure a reasonable and evenhanded approach. The implementation of the rules will be monitored carefully for the first several months.

One commenter inquired about the fate of applications which had acceptable drawings when filed but the drawings were damaged by Patent and Trademark Office personnel. As in the case of other applications which are improperly returned, a filing date which is erroneously cancelled will be reinstated.

Environmental, energy, and other considerations:

The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) since any additional burden would be minimal and not disproportionate in effect.

This rule contains no new information collection requirement for the purpose of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The existing application requirements referenced in this rule have been approved by OMB (Approval No. 0651-0009).

The Patent and Trademark Office has determined that these changes do not constitute major rules as defined in section 1(b) of Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 2

Administrative practice and procedures, Courts, Lawyers, Trademarks.

After consideration of the comments received and pursuant to the authority contained in section 41 of the Trademark Act of July 5, 1946, as amended, and 35 U.S.C. 6, Part 2 of Title 37 of The Code of Federal Regulations is amended as set forth below.

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123, 35 U.S.C.6, unless otherwise noted.

In §2.21 paragraph (a) introductory text is republished and paragraph (a)(3) is revised to read as follows:

§2.21 Requirements for receiving a filing date.

(a) Materials submitted as an application for registration of a mark will not be accorded a filing date as an

application until all of the following elements are received:

* * * * *

(3) A drawing of the mark sought to be registered substantially meeting all the requirements of §2.52;

* * * * *

3. Section 2.52 is revised to read as follows:

§2.52 Requirements for drawings.

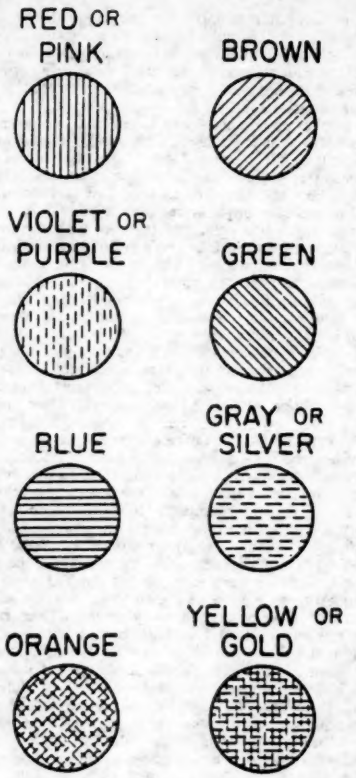
(a) *Character of drawing.* All drawings, except as otherwise provided, must be made with the pen or by a process which will provide high definition upon reproduction. A photolithographic reproduction or printer's proof copy may be used if otherwise suitable. Every line and letter, including color lining and lines used for shading, must be black. All lines must be clean, sharp, and solid, and must not be fine or crowded. Gray tones or tints may not be used for surface shading or any other purpose. The requirements of this paragraph are not necessary in the case of drawings permitted and filed in accordance with paragraph (d) of §2.51.

(b) *Paper and ink.* The drawing must be made upon paper which is flexible, strong, smooth, nonshiny, white and durable. A good grade of bond paper is suitable; however, water marks should not be prominent. India ink or its equivalent in quality must be used for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not acceptable.

(c) *Size of paper and margins.* The size of the sheet on which a drawing is made must be 8 to 8½ inches (20.3 to 21.6 cm.) wide and 11 inches (27.9 cm.) long. One of the shorter sides of the sheet should be regarded as its top. It is preferable that the drawing be 2.5 inches (6.1 cm.) high and/or wide, but in no case may it be larger than 4 inches (10.3 cm.) high and 4 inches (10.3 cm.) wide. If the amount of detail in the mark precludes a reduction to this size, such detail may be verbally described in the body of the application. There must be a margin of at least 1 inch (2.5 cm.) on the sides and bottom of the paper and at least one inch (2.5 cm.) between the drawing and the heading.

(d) *Heading.* Across the top of the drawing, beginning one inch (2.5 cm.) from the top edge and not exceeding one fourth of the sheet, there must be placed a heading, listing in separate lines, applicant's complete name, applicant's post office address, the dates of first use of the mark and first use of the mark in commerce (except for an application filed under section 44 of the Trademark Act), and the goods or services recited in the application or a typical item of the goods or services if a number of items are recited in the application. This heading should be typewritten.

(e) *Linings for color.* Where color is a feature of a mark, the color or colors employed may be designated by means of conventional linings as shown in the following color chart:



§2.54 [Removed]

4. Section 2.54 is removed.

5. Section 2.58(b) is revised to read as follows:

§2.58 Specimens or facsimiles in the case of a service mark.

* * * * *

(b) In the case of service marks not used in printed or written form, three audio cassette tape recordings will be accepted.

July 3, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Patents.

[FR Doc. 86-18864 Filed 8-20-86; 8:45 am]
BILLING CODE 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of Sept. 23, 1986

D. 281,415	4,547,801	4,581,072	4,591,518
3,609,014	4,548,271	4,581,268	4,591,976
3,987,684	4,549,130	4,581,385	4,592,234
4,379,853	4,549,620	4,581,462	4,592,379
4,446,491	4,550,304	4,581,546	4,592,662
4,449,704	4,550,716	4,582,217	4,592,672
4,454,206	4,551,613	4,582,898	4,593,008
4,455,646	4,553,668	4,583,280	4,593,111
4,461,712	4,557,587	4,583,352	4,593,672
4,461,903	4,557,977	4,583,884	4,593,898
4,463,211	4,558,069	4,584,220	4,594,689
4,471,417	4,561,867	4,584,254	4,594,871
4,474,177	4,561,884	4,584,449	4,595,011
4,477,030	4,561,971	4,584,628	4,595,301
4,490,038	4,563,525	4,584,972	4,595,438
4,492,238	4,563,631	4,585,381	4,595,452
4,492,967	4,563,706	4,585,891	4,595,584
4,493,326	4,564,022	4,586,504	4,595,705
4,494,681	4,565,492	4,586,752	4,595,782
4,501,754	4,566,371	4,586,971	4,595,788
4,508,573	4,566,480	4,587,135	4,596,867
4,511,222	4,568,010	4,587,156	4,596,896
4,512,543	4,568,680	4,587,182	4,597,126
4,515,845	4,568,716	4,587,320	4,597,178
4,517,294	4,569,718	4,587,355	4,597,885
4,518,105	4,569,888	4,587,507	4,597,944
4,519,533	4,570,167	4,588,135	4,598,076
4,521,444	4,571,505	4,588,315	4,598,199
4,521,805	4,572,781	4,588,925	4,598,249
4,522,607	4,572,896	4,589,281	4,598,284
4,523,226	4,572,917	4,589,838	4,598,473
4,524,185	4,573,021	4,589,964	4,598,727
4,525,665	4,573,522	4,590,130	4,599,085
4,527,021	4,575,162	4,590,138	4,599,153
4,530,770	4,578,127	4,590,208	4,599,518
4,531,192	4,578,349	4,590,377	4,599,565
4,534,059	4,578,704	4,590,593	4,599,724
4,536,571	4,579,071	4,590,607	4,600,597
4,539,308	4,579,366	4,591,135	4,601,661
4,539,482	4,579,760	4,591,421	4,602,752
4,542,352	4,580,241	4,591,452	
4,546,171	4,580,337	4,591,505	
4,546,583	4,581,028	4,591,517	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 2, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-08-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	3-20-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	11-09-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-24-84
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-25-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,458,863 to 3,464,062, inclusive

Plant Patents ..... Numbers 2,914 to 2,917 inclusive

REEXAMINATIONS

SEPTEMBER 23, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,964,405 (568th)

PERENNIAL WEED CONTROL BY DEEP PLACEMENT OF VOLATILE SOIL FUMIGANTS

William A. Haglund, P.O. Box 693, Mount Vernon, Wash. 98273, and Theodore P. Reiling, 500 Boright Apt. 101, Le Sueur, Minn. 56058

Reexamination Request No. 90/000,055, Aug. 14, 1981.
Reexamination Certificate for Patent No. 3,964,405, issued Jun. 22, 1976, Ser. No. 121,576, Mar. 5, 1971.
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–13** are cancelled.

New claims **14–19** are added and determined to be patentable.

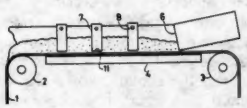
15. The method of claim 14 wherein 1,3-dichloropropene is injected.

B1 3,984,329 (569th)

DEVICE FOR EXTRACTING LIQUID FROM SLUDGE

Lothar Wenzel, Niefern, and Ulrich Kollmar, Pforzheim-Wurm, both of Fed. Rep. of Germany, assignors to Firma Gebruder Bellmer KG, Maschinenfabrik, Niefern, Fed. Rep. of Germany

Reexamination Request No. 90/000,759, Apr. 12, 1985.
Reexamination Certificate for Patent No. 3,984,329, issued Oct. 5, 1976, Ser. No. 552,749, Feb. 25, 1975.
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1974, 2409269
Int. Cl.[4] B01D *33/36*
U.S. Cl. 210—396



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **6** and **7** is confirmed.

Claims **1–5** are cancelled.

New claims **8–38** are added and determined to be patentable.

8. In a device for extracting liquid from a suspension or sludge, the combination comprising:

a continuously advancing endless perforate conveyer belt having a substantially horizontally extending belt strand;

guide means for supporting the horizontal conveyor belt strand from underneath, said guide means being pervious to liquid;

means for depositing onto the advancing conveyor belt strand a continuous bed of suspension or sludge;

walls for laterally retaining said suspension or sludge bed on the advancing conveyor belt strand, as its liquid component progressively passes downwardly through the belt and guide means;

at least two successive rows of downwardly pointing flow breakers arranged above the horizontal conveyor belt strand so as to extend into the moving sludge bed, thereby disturbing the sludge flow and preventing the premature formation of a layer of solid material immediately above the conveyor belt strand; and

means for effecting upward swinging of the flow breakers during normal operation in response to impingement of solid matter on the flow breakers to permit the solid matter to move past the flow breakers; and wherein

each row of flow breakers is carried by a transversely extending supporting rod which is mounted in the lateral retaining walls;

the upward swinging means includes a transverse pivot axis for the flow breakers at a level above the normal level of the sludge and about which the flow breakers are swingable, the transverse pivot axis being defined by the supporting rods and associated flow breakers; and

the flow breakers are subjected to an angular biasing force urging them into a normal operating position against the movement of the sludge bed on the conveyor.

B1 4,089,491 (570th)

CAMOUFLAGED AIRCRAFT, SURFACE VESSEL OR VEHICLE OR THE LIKE

Carlisle K. Ferris, 50 Moraine Rd., Morris Plains, N.J. 07950

Reexamination Request No. 90/000,904, Nov. 14, 1985.
Reexamination Certificate for Patent No. 4,089,491, issued May 16, 1978, Ser. No. 668,983, Mar. 22, 1976.
Int. Cl.[4] B64D *7/00*
U.S. Cl. 244—1 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–37** is confirmed.

Claims **38, 39, 41** and **43** are cancelled.

Claims **40, 42** and **44** are determined to be patentable as amended.

Claim **45** dependent on an amended claim, is determined to be patentable.

New claims **46–51** are added and determined to be patentable.

47. A camouflaged and deceptive perception distorted aircraft comprising:

a) an aircraft fuselage having nose and tail, and top, side and bottom surfaces;

b) a real cockpit-canopy on said top surface;

c) a simulated cockpit-canopy on said bottom surface positioned

substantially in the same general area longitudinally of said fuselage as said real cockpit-canopy so that,

d) only one of said canopies is visible when said aircraft is perceived from directly above said top surface or directly below said bottom surface; and,

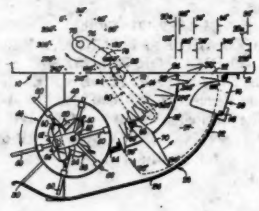
e) a coating on the bottom surface of said aircraft fuselage outlining said simulated cockpit-canopy.

B1 4,132,164 (571st)

BALER LOADING METHOD AND APPARATUS

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Reexamination Request No. 90/000,820, Jul. 12, 1985.
Reexamination Certificate for Patent No. 4,132,164, issued Jan. 2, 1979, Ser. No. 778,265, Mar. 16, 1977.
Division of Ser. No. 675529, Apr. 9, 1976, Pat. No. 4,132,162.
Int. Cl.[4] B30B *1/00*
U.S. Cl. 100—189



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **13** is cancelled.

Claims **1** and **14** are determined to be patentable as amended.

Claims **2–12** and **15–17**, dependent on an amended claim, are determined to be patentable.

New claims **18** and **19** are added and determined to be patentable.

1. Loading apparatus for stuffing a charge of material into a baling chamber for compaction by a reciprocating plunger, said apparatus comprising:

a duct leading into the chamber;

a lever having crop engaging structure at one end thereof;

operating mechanism [for driving] *pivotally coupled with* the opposite end of the lever *for driving said opposite end* in a circular path of travel;

a stationary fulcrum about which the lever is turned by the operating mechanism; and

means for allowing the turning point of the lever to seek its own variable position along the length of the lever as the opposite end of the latter is driven by said mechanism, thereby causing said structure to move in a closed loop of travel into, along, and out of said duct.

B1 4,469,226 (572nd)

BLISTER PACK PANEL FOR FACE POWDER COMPACT DISPLAY

Arthur Matney, 360 Furman St., Brooklyn, N.Y. 11201

Reexamination Request No. 90/000,971, Mar. 17, 1986.
Reexamination Certificate for Patent No. 4,469,226, issued Sep. 4, 1984, Ser. No. 525,644, Aug. 23, 1983.
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—470

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A compact display unit permitting a compact to be opened to check the color of face powder therein by the purchaser comprising:

a plate-like backing member to which an enclosing cover is adapted to be affixed;

a pre-cut and pre-formed blister serving as the enclosing cover for the bottom of the compact enclosed therein and heat sealed in flat blister to panel relationship to said panel;

a compact comprising a top, a bottom, a hinge, and opposite said hinge a clasp consisting of a latch and a latching element, said compact being provided with a powder chamber in the bottom holding powder, a mirror chamber in the top holding a mirror, and face powder in said powder chamber;

said pre-cut and pre-formed blister having a top wall which fits over the powder chamber of said compact between the mirror and the powder, an indented portion forming a depending stiffening groove which fits flat against the bottom of the compact, a straight cut-out portion adjacent the hinge of the compact which is tangent to the edge of the powder chamber and directly opposite said cut-out portion folded over portions constituting an intermediate projection for the latching parts of the clasp and projecting portions to the right and left of said intermediate projection which project from the side walls of said blister to register the clasp and hinge with the blister in place; and

said blister further provided with a flange at its bottom which surrounds the blister except at the hinge portion of the compact where the flange is provided with flange termination portions to register against the sides of the hinge when the flange is heat sealed to the panel to securely attach the blister around the bottom of the compact.

B1 4,501,659 (573rd)

SKIMMER APPARATUS FOR SWIMMING POOLS

Charles R. Henk, 581 Princeton Ave., Brick Town, N.J. 08723

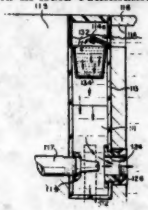
Reexamination Request No. 90/000,910, Nov. 21, 1985.
Reexamination Certificate for Patent No. 4,501,659, issued Feb. 26, 1985, Ser. No. 447,512, Dec. 7, 1982.
Filed Nov. 21, 1985, Ser. No. 447,512
Int. Cl.[4] E04H *3/16*
U.S. Cl. 210—169

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3** and **13** are determined to be patentable as amended.

Claims **2**, **4–12** and **14**, dependent on an amended claim, are determined to be patentable.

1. For a swimming pool having a body of water and a water inlet for introducing make-up water into said body to maintain a normal surface level, a skimmer apparatus for collecting solid materials suspended in said body comprising a receiver having an open top and a foraminous portion below said open top, means to support said receiver with its open top adjacent the surface level of the body of water, a receptacle *providing a chamber beyond and* in fluid communication with said foraminous portion of said receiver *and with said open top through said foraminous portion*, means defining a discharge opening in said receptacle *chamber* for directing water from said receptacle into the body of water, and nozzle means adapted to be connected to said water inlet and positioned in registry with said discharge opening to direct a stream of the make-up water from the inlet through said discharge opening, said opening being sufficiently larger than said nozzle stream to cause said nozzle to eject *pool* water from said receptacle *chamber* through said outlet along with the make-up water, the ejection of *pool* water from said receptacle *chamber* causing pool water to flow into the open top of said receiver and through the foraminous portion, solid material in the pool water being trapped in said [receptacle by] *receiver above* said foraminous portion.



B1 4,495,285 (574th)

PLASMINOGEN ACTIVATOR DERIVATIVES

Kimihiro Shimizu, Saitama; Tsuguji Nakahara, Tokyo, and Taketoshi Kinoshita, Saitama, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Reexamination Request No. 90/000,821, Jul. 12, 1985.
Reexamination Certificate for Patent No. 4,495,285, issued Jan. 22, 1985, Ser. No. 437,009, Oct. 27, 1982.
Claims priority, application Japan, Oct. 30, 1981, 56-172908
Int. Cl.[4] C12N *9/72, 9/48, 11/06*
U.S. Cl. 435—215

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. A derivative of a human-originated non-immunogenic plasminogen activator, comprising at least one polyalkylene glycol chemically bonded with at least one coupling agent to amino acid side chains of said plasminogen activator, wherein said polyalkylene glycol has a molecular weight in the range of 200–20,000 and is unsubstituted or is substituted with one or more alkyl or one or more alkanoyl groups.

REISSUES

SEPTEMBER 23, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,249

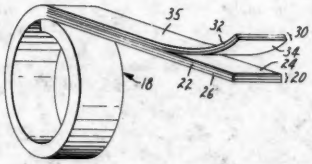
LINERLESS DOUBLE-COATED PRESSURE-SENSITIVE ADHESIVE TAPE

Donald L. Esmay, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Original No. 4,522,870, dated Jun. 11, 1985, Ser. No. 481,813, Apr. 4, 1983. Continuation-in-part of Ser. No. 439,047, Nov. 3, 1982, abandoned. Application for reissue Sep. 19, 1985, Ser. No. 782,981

Int. Cl. A61F *13/02*

U.S. Cl. 428—40 **14 Claims**



1. A linerless double-coated pressure-sensitive adhesive tape comprising a flexible support, at each face of which is a pressure-sensitive adhesive, which tape can be wound directly upon itself into a roll that can later be unwound without delamination or offsetting of adhesive, wherein the improvement comprises: each pressure-sensitive adhesive layer

(a) is a polymerized product of a predominantly alkyl acrylate composition, the alkyl groups of which have an average of 4–12 carbon atoms, each said composition being physically compatible with the other,

(b) is substantially solvent-free,

(c) contains a photoinitiator,

(d) is crosslinked, and

(e) affords at each face a 180° Peelback Value of at least 10 N/dm.

Re. 32,250

STABILIZATION OF SILICATES USING SALTS OF SUBSTITUTED NITROGEN OR SULFUR CONTAINING SILICONATES

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

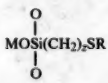
Original No. 4,344,860, dated Aug. 17, 1982, Ser. No. 248,131, Mar. 30, 1981. Application for reissue Jul. 11, 1983, Ser. No. 512,306

Int. Cl.[4] **C07F** *7/02, 7/08, 7/10;* **C09K** *3/00*

U.S. Cl. 252—389.1 **118 Claims**

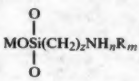
1. A method of stabilizing soluble silicates comprising adding to the soluble silicates a siliconate selected from a group consisting essentially of

(I) a siliconate having the general formula



and

(II) a siliconate having the general formula

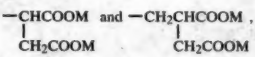


wherein in both formulas, M is selected from a group consisting essentially of

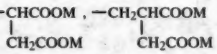
(i) alkali metal cations and

(ii) tetraorganoammonium cations and z has a value of 2 or 3,

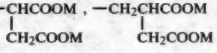
wherein in formula (I), R is selected from a group consisting essentially of —CH_2COOM, —CH_2CH_2COOM,



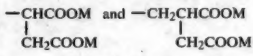
and wherein in formula (II), n has a value of 0 or 1; m has a value of 1 or 2, the sum of n+m is 2 and *each* R is *independently* selected from a group consisting essentially of —CH_2COOM, —CH_2CH_2COOM,



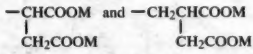
and —$(CH_2)_2N(CH_2COOM)_2$ when n is 0 and m is 2, and R is selected from a group consisting essentially of



and $(CH_2)_zNH_pR'_q$ when n is 1 and m is 1, p has a value of 0 or 1, q has a value of 1 or 2 and the sum of p+q is 2 wherein R′ is selected from a group consisting of



when p is 1 and q is 1 and R′ is selected from a group consisting of —CH_2COOM, —CH_2CH_2COOM,



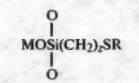
when p is 0 and q is 2, wherein M and z have the same meaning as set forth above.

26. An alcohol composition comprising a combination of

(A) an alcohol;

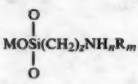
(B) a corrosion inhibiting amount of a composition which is selected from a group consisting of

(I) a siliconate having the general formula



and

(II) a siliconate having the general formula

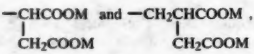


wherein in both formulas, M is selected from a group consisting essentially of

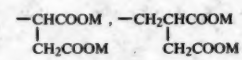
(i) alkali metal cations and

(ii) tetraorganoammonium cations and z has a value of 2 or 3,

wherein in formula (I), R is selected from a group consisting essentially of $-CH_2COOM$, $-CH_2CH_2COOM$,

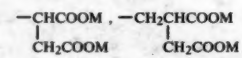


and wherein in formula (II), n has a value of 0 or 1; m has a value of 1 or 2, the sum of n+m is 2 and *each* R is *independently* selected from a group consisting essentially of $-CH_2COOM$, $-CH_2CH_2COOM$,

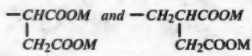


and $-(CH_2)_2N(CH_2COOM)_2$

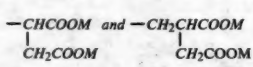
when n is 0 and m is 2, and R is selected from a group consisting essentially of



and $(CH_2)_zNH_pR'_q$ when n is 1 and m is 1, p has a value of 0 or 1, q has a value of 1 or 2 and the sum of p+q is 2, [and] *wherein R' is selected from a group consisting of*

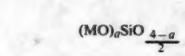


when p is 1 and q is 1 and R' is selected from a group consisting of $-CH_2COOM$, $-CH_2CH_2COOM$,



when p is 0 and q is 2, wherein M and z have the same meaning as set forth above;

(C) a soluble silicate [represented by the general formula

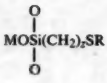


wherein M has the meaning above and a has a value of 1-3] and

(D) water.

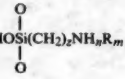
86. A method of inhibiting metal corrosion in an aqueous medium by adding to the aqueous medium a composition consisting of a siliconate selected from a group consisting of

(I) a siliconate having the general formula



and

(II) a siliconate having the general formula

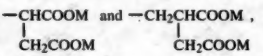


wherein in both formulas, M is selected from a group consisting essentially of

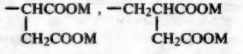
(i) alkali metal cations and

(ii) tetraorganoammonium cations and z has a value of 2 or 3,

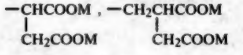
wherein in formula (I), R is selected from a group consisting essentially of $-CH_2COOM$, $-CH_2CH_2COOM$,



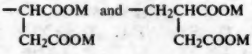
and wherein in formula (II), n has a value of 0 or 1; m has a value of 1 or 2, the sum of n+m is 2 and *each* R is *independently* selected from a group consisting essentially of $-CH_2COOM$, $-CH_2CH_2COOM$,



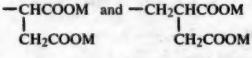
and $-(CH_2)_2N(CH_2COOM)_2$ when n is 0 and m is 2, and R is selected from a group consisting essentially of



and $(CH_2)_zNH_pR'_q$ when n is 1 and m is 1, p has a value of 0 or 1, q has a value of 1 or 2 and the sum of p+q is 2 wherein R' is selected from a group consisting of



when p is 1 and q is 1 and R' is selected from a group consisting of $-CH_2COOM$, $-CH_2CH_2COOM$,

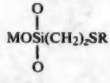


when p is 0 and q is 2, wherein M and [Z] *z* have the same meaning as set forth above.

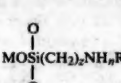
100. A composition of matter comprising

(A) 0.1 to 20 mole percent of a siliconate selected from a group consisting essentially of

(I) a siliconate having the general formula



and (II) a siliconate having the general formula

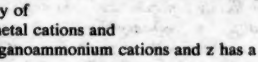


wherein in both formulas, M is selected from a group consisting essentially of

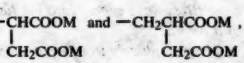
(i) alkali metal cations and

(ii) tetraorganoammonium cations and z has a value of 2 or 3,

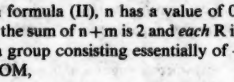
wherein in formula (I), R is selected from a group consisting essentially of $-CH_2COOM$, $-CH_2CH_2COOM$,



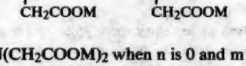
and wherein in formula (II), n has a value of 0 or 1; m has a value of 1 or 2, the sum of n+m is 2 and *each* R is *independently* selected from a group consisting essentially of $-CH_2COOM$, $-CH_2CH_2COOM$,



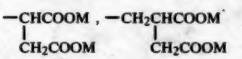
and $-(CH_2)_2N(CH_2COOM)_2$ when n is 0 and m is 2, and R is selected from a group consisting essentially of



and $(CH_2)_zNH_pR'_q$ when n is 1 and m is 1, p has a value of 0 or 1, q has a value of 1 or 2 and the sum of p+q is 2, *wherein R' is selected from a group consisting of*

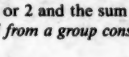


when p is 1 and q is 1 and R' is selected from a group consisting of $-CH_2COOM$, $-CH_2CH_2COOM$,



when p is 0 and q is 2, wherein M and z have the same meaning as set forth above and

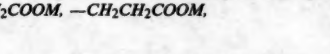
(B) 80 to 99.9 mole percent of a soluble silicate [represented by the general formula



wherein M has the meaning above and a has a value of 1-3].

115. A composition of matter comprising

(A) 0.2 to 20 mole percent of



and

(B) 80 to 99.9 mole percent of a soluble silicate.

Re. 32,251

METHOD OF ELECTRIC WELDING TINFREE CANS

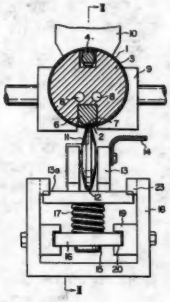
Kenji Matsuno, Yokohama, and Hiroyuki Funamoto, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Original No. 4,334,138, dated Jun. 8, 1982, Ser. No. 150,775, May 19, 1980. Application for reissue May 18, 1984, Ser. No. 612,105

Claims priority, application Japan, Aug. 6, 1979, 54-99479; Aug. 23, 1979, 54-106696

Int. Cl.[4] B23K *11/06*

U.S. Cl. 219—64 8 Claims



1. A method of making a tinfree steel can body having a mash welded side seam from a blank of a tinfree steel, said tinfree steel having a surface chromium layer consisting of a metallic chromium layer of 20~200 mg/m^2 and a chromium oxide layer thereof of 5~30 mg/m^2 in terms of chromium which comprises

preparing a can body preform having a side lapped portion, formed from the blank of said tinfree steel whose opposite marginal portions to be overlapped remain as they are without removing said surface chromium layer, said lapped portion being formed by overlapping said marginal portions, so that the width of said lapped portion is 0.2~1.2 mm;

providing a cooled elongated electrode having an electrode surface the width of which is greater than that of said lapped portion, and a cooled rotary electrode opposite to said elongated electrode and having an electrode surface the width of which is greater than that of said lapped portion, and a radius of curvature of at least 50 mm;

placing said can body preform such that the inner side of said lapped portion is opposed to said electrode surface of said elongated electrode;

moving said rotary electrode in the direction of said lapped portion while pressing the whole width of said lapped portion between said electrode surfaces of said elongated electrode and said rotary electrode with a welding force of 40 to 500 kg and satisfying the relationship of $1/100 \leqq L/W \leqq 1/00$, wherein L is the width of said lapped portion in mm and W is the welding force in kg; and

simultaneously, applying an A.C. current between said elongated electrode and said rotary electrode, and seam resistant welding said lapped portion, so as to form a mash welded side seam whose thickness is 1.0 to 1.6 times as large as the thickness of the blank of said tinfree steel, at least the portion of the inner surface of said side seam which was brought into contact with said elongated electrode being covered with said surface chromium layer.

Re. 32,252

METHOD OF AND APPARATUS FOR PROVIDING INFORMATION AS TO THE EXISTENCE OR POSITION OF OBJECTS

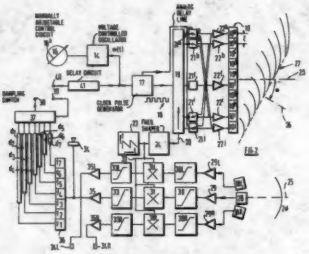
Leslie Kay, 82 Scarborough Road, Christchurch 8, New Zealand

Original No. 4,310,903, dated Jan. 12, 1982, Ser. No. 68,432, Aug. 21, 1979. Application for reissue Jan. 11, 1984, Ser. No. 569,880

Claims priority, application New Zealand, Aug. 21, 1978, 188192

Int. Cl.[4] G01S 15/34

U.S. Cl. 367—102 17 Claims



13. In a method of providing information as to the existence or position of objects otherwise than by direct vision comprising the steps of, radiating stress wave energy (herein called the transmitted signal) from a station to a field of view, receiving at the station at least part of the transmitted signal (such part herein being called the received signal) reflected from the object, carrying out a frequency modulation of the transmitted signal to produce a frequency difference between the received signal and a correspondingly frequency modulated locally generated signal in a mode such that the magnitude of the frequency difference represents the range of the object from the station, operating upon the received signal with the locally generated signal to produce an indicator signal of said difference frequency providing for range indication, and determining or sensing the angular position of the object with respect to a reference axis extending through the station and the field of view by utilization of a characteristic of the indicator signal which is dependent upon the angular position of the object, the improvement comprising:

(a) radiating the stress wave energy into the field of the view in the form of a beam,

(b) moving the beam angularly from a datum position occupied at a datum time to effect scanning of the field of view successively to irradiate objects contained in successive sectors of the field of view having angular widths corresponding to that of the beam,

(c) operating on indicator signals derived from the received signals due to these objects, to segregate said indicator signals in a manner corresponding to the scanning position of the beam, and in another manner corresponding to the range of the object, and

(d) compensating for the transit time of the transmitted and received signals in the field of view.

PATENTS

GRANTED SEP. 23, 1986

ERRATA

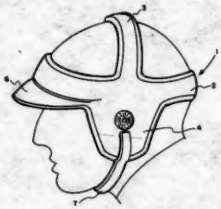
For CLASS	See PATENT NO.
084–001	4,612,838
084–001	4,612,839
084–269	4,612,840
084–484	4,612,841
138–093	4,612,961
280–260	4,613,010
364–513	4,613,269
420–042	4,613,367
530–351	4,613,458
530–351	4,613,459
560–041	4,613,460
540–608	4,613,461
540–310	4,613,462
540–094	4,613,463
560–344	4,613,466
568–015	4,613,699
568–435	4,613,700
568–454	4,613,701
568–490	4,613,702
568–640	4,613,703
568–819	4,613,710

PATENTS

GRANTED SEPTEMBER 23, 1986

GENERAL AND MECHANICAL

4,612,672
PROTECTIVE HEAD GEAR
Michael E. Schrack, 4435 Portola Dr., Santa Cruz, Calif. 95062
Filed Feb. 6, 1985, Ser. No. 698,676
Int. Cl.[4] A42B *1/12*
U.S. Cl. 2—68 **7 Claims**



1. A floatable, lightweight protective sports head gear comprising:

a retaining means for retaining said head gear on a user's head, said retaining means including a ring-shaped member for extending around a user's head;

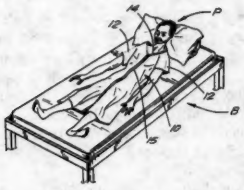
a transverse strip for extending over the top of a user's head from opposite edges of said ring-shaped member;

chin strap means;

ear protecting means, said ear protecting means including a pair of members which extend from opposite edges of said ring-shaped member for covering a user's ears and from which said chin strap means extends, a cavity located in each of said ear covering members for receiving a user's ear and a fluid and air passageway which extends from said cavity through and to the outside of said ear covering member; and

sun visor means which extends from said ring-shaped member, and wherein said retaining means, said ear protecting means and said sun visor means are made from a soft, resilient closed-cell material which is entirely enclosed within a soft, flexible, watertight covering.

4,612,673
PATIENT GOWN
Kim Underhill, 1311 NE 26th Ave., Pompano Beach, Fla. 33062
Filed Dec. 31, 1984, Ser. No. 688,074
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—114 **3 Claims**



1. A patient gown comprising, in combination,

a body portion formed from a single bilaterally symmetrical pattern piece,

said pattern piece having identical front and rear symmetrical V-neck portions,

a pair of sleeves, each formed from a bilaterally symmetrical pattern piece,

said sleeves being closed at the bottom and secured to lateral upper opposed portions of the body piece,

a single body opening depending from the base of one of the V-neck body portions,

a single opening at the top of each sleeve portion,

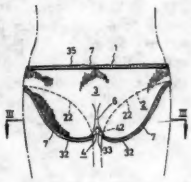
intermittent pressure sensitive opposed members secured to said openings to removably secure the same,

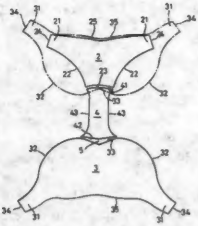
at least two such pressure sensitive members securing each of the single body and two sleeve openings,

one each of said pressure sensitive members being closely adjacent the neck intersection with the sleeve and body openings,

whereby total reversibility of the garment is insured with securement at the neck draping areas with the opening for inspection and insertion of patient treatment elements through the openings.

4,612,674
UNDERWEAR AND METHOD OF MAKING SAME
Kenji Hashimoto, Nishinomiya, Japan, assignor to Yabumoto Kenji, Amagasaki, Japan, a part interest
Continuation of Ser. No. 651,363, Sep. 17, 1984, abandoned, which is a continuation of Ser. No. 280,004, Jun. 30, 1981, abandoned. This application Sep. 9, 1985, Ser. No. 774,180
Claims priority, application Japan, Oct. 31, 1979, 54-150958[U]
Int. Cl.[4] A41B *9/04*
U.S. Cl. 2—406 **5 Claims**





1. Underwear comprising a front piece for covering the lower abdomen, a rear piece for totally covering the buttocks and a connector piece interconnecting the front piece and the rear piece for covering the crotch, the front piece and the rear piece, each being symmetrically shaped about respective center lines and each having upper side portions and lower ends, and being stitched together at their opposing upper side portions, the connector piece also being symmetrically shaped about a centerline and having a first end and a second end and being stitched at its first end to the lower end of the front piece, with their respective centerlines aligned and with the lower end of the front piece and the first end of the connector piece being curved so as to conform with each other, the second end

of the connector piece and the lower end of the rear piece being shaped such that, when placed with respective lateral edges thereof in abutting relation with each other and with their respective centerlines aligned, there is defined therebetween a space shaped symmetrically with respect to the center line of alignment and of the space and having a progressively increasing width toward the center line from the abutting lateral edges, the rear piece being stitched at its lower end to the second end of the connector piece while being stretched to the greatest extent on the center line of symmetry of the rear piece so that the underwear has an elongated depression extending inwardly toward the wearer on the centerline of the rear piece and conforming to the gluteal cleft between the buttocks and so that the rear piece has round portions extending outwardly in conformity with the bulges of the buttocks on the opposite sides of the depression, the juncture of the rear piece and the connector piece being at the lowermost portion between the left and right buttocks when the underwear is worn.

5. A method of making underwear by joining together a front piece for covering the lower abdomen, a rear piece for covering the buttocks and a connector piece for covering the crotch, the method comprising cutting out the front piece, the rear piece and the connector piece from a fabric material, the front piece and the rear piece each being symmetrically shaped about respective center lines and each having upper side portions and lower ends and the connector piece also being symetrically shaped about a center line and having a first end and a second end, stitching together the corresponding upper side portions of the front and rear pieces, stitching together the lower end of the front piece and the first end of the connector piece, and stitching the lower end of the rear piece and the second end of the connector piece together at adjoining portions thereof with their respective center lines of symmetry aligned while stretching the rear piece toward the connector piece to the greatest extent along the center line of symmetry of the rear piece and to a progressively lesser extent in the portions further away from the center line toward the opposite sides thereof to form an elongated depression extending inwardly toward the wearer on the center line of the rear piece and a bulged portion on each side of the depression.

4,612,675

HELMET WITH ADJUSTABLE VENTILATION

Lester V. Broersma, Bellflower, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.

Filed Mar. 7, 1985, Ser. No. 709,216
Int. Cl.[4] A42B 3/02
U.S. Cl. 2—424 **21 Claims**

1. In a motorcyclist or bicyclist helmet having dome shaped top wall structure, side wall structures, a front opening for forward viewing, a shield associated with said front opening, a lower front wall structure which juts forwardly, and rear wall structure, the combination comprising

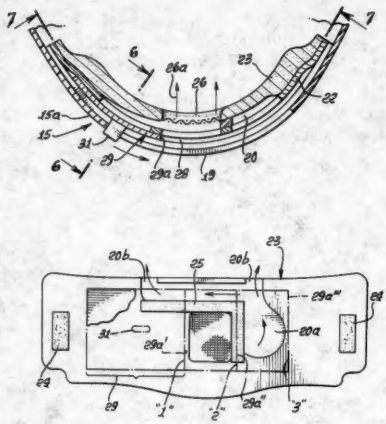
(a) a frontward facing air inlet means defined by said lower front wall structure,

(b) passage means in the helmet to receive air inflow from said inlet means for circulation to different portions of the interior of the helmet and subsequent flow to the helmet exterior,

(c) and a closure carried by the helmet front wall structure for movement adjustably controlling said passage means, said helmet wall structure including a shell,

(d) there being wall elements rearwardly of said closure and defining a sub-assembly attached to said shell, said elements defining said passage means which includes a primary passage to direct inflowing air upwardly toward the inner side of said shield, and a secondary passage to direct inflowing air rearwardly toward the interior of the helmet,

(e) said closure movable laterally rearwardly of said air inlet means between a first position in which air inflow is passed by both said primary and secondary passages, and a second position in which air inflow is passed by only one of said primary and secondary passages, and a third position in which passage of air inflow by both said primary and secondary passages is blocked.

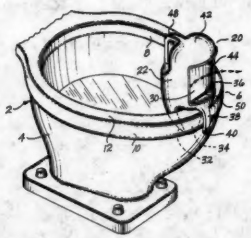


4,612,676

URINAL ATTACHMENT FOR TOILET

Victoria E. Whitman, P.O. Box 377, Black Diamond, Wash. 98010

Filed Jun. 7, 1985, Ser. No. 742,205
Int. Cl.[4] E03D 9/00
U.S. Cl. 4—300.3 **14 Claims**



1. A urinal attachment for mounting on the rim of a toilet bowl, comprising:

a receptacle having a rear wall portion and opposite sidewall portions defining a downwardly-directed outlet opening and a substantially vertical, forwardly-directed inlet opening;

a substantially vertical inner rim-engaging wall depending downwardly from and extending between said opposite sidewall portions and spaced rearwardly from said inlet opening for engaging an inner vertical surface of a front portion of said rim;

a generally horizontal wall extending generally forwardly from the top edge of said rim-engaging wall; and

substantially vertical leg means depending downwardly from a forward portion of said horizontal wall for engaging an outer vertical surface of said front portion of said rim, said leg means being sufficiently flexible and resilient to permit the attachment to be removably positioned with said front portion of said rim securely gripped between said rim-engaging wall and said leg means;

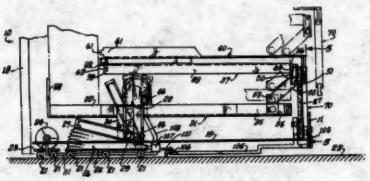
said sidewall portions, rim-engaging wall, and horizontal wall being positioned and dimensioned to position the inlet opening forward of said inner vertical surface of said front portion of said rim, to help prevent spillage around said front portion.

4,612,677

CONVERTIBLE SOFA MECHANISM

Edward H. Crossett, P.O. Box 10152, Costa Mesa, Calif. 92627

Filed Sep. 9, 1985, Ser. No. 773,982
Int. Cl.[4] A47C *17/14*
U.S. Cl. 5—12 R 14 Claims



1. An improved, three-section convertible sofa mechanism for installation in a convertible sofa and which may be forwardly extended to a full length bed having a head section, a middle section and a foot section, wherein the improvement comprises:

a base member supported on a floor, said base member having a right side, a left side, a front edge and a back edge and having an upwardly extending support along its front edge;

first and second inverted "J-shaped" channels held along the right and left sides of the base member, respectively, and oriented so that the terminus of the "J" is facing the front edge of the base;

first and second main bellows members held by said base and adjacent said first and second inverted "J-shaped" channels, each of said main bellows having a straight sidewardly-facing channel on its upper surface;

a head section held by said base above said base and generally parallel thereto, said head section having a right side, a left side, a front edge and a back edge;

right and left cam follower means affixed to the right and left edges of said head section, each of said cam follower means being captured both by an inverted "J-shaped" channels and by one of the straight, sidewardly-facing channels whereby when said main bellows members are inflated, said cam follower means and their associated head section are carried outwardly along said straight, sidewardly-facing channels and upwardly, outwardly and downwardly along said "J-shaped" channels an extent sufficient to cause the head section to rest near its front edge on the upwardly extending support on said base member;

a middle section having a right side, a left side, a front edge and a back edge, said middle section being hingedly affixed at its back edge to the front edge of said head section and in its folded condition being supported in a parallel manner above the head section, said middle section having leg means affixed along the right and left edges at the back edge thereof; and

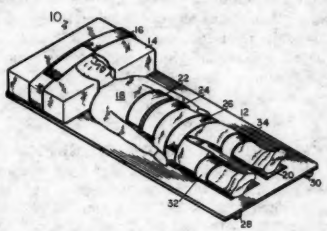
a foot section having a right side, a left side, a front edge and a back edge, said foot section being hingedly affixed at its back edge to the front edge of said middle section and having leg means affixed along the right and left edges thereof at the front edge thereof, said foot section being moveable between a folded configuration when it is parallel to and above the middle section and to an extended configuration when it is in line with the middle section.

4,612,678

TRAUMA BOARD AND METHOD OF USING SAME

Margot Fitsch, 870 Satucket Rd., Brewster, Mass. 02631

Filed Mar. 11, 1985, Ser. No. 710,300
Int. Cl.[4] A61G *1/00, 1/04*
U.S. Cl. 5—82 R 13 Claims



1. A trauma board for use in handling a patient to be immobilized, which trauma board comprises:

(a) a rigid, generally flat board having a head end and a surface, on which surface the patient is to be immobilized;

(b) a semirigid, one-piece, continuous foam head block means toward the head end of the board, said foam head block means having a contoured whole head and neck cavity therein, to form a foam wall about the back, sides and top of the head and the sides and back of the neck of the patient, to maintain the head of the patient immobilized, with the forehead of the patient at about the level of the top surface of said block, said foam head block being sufficiently resilient, to permit the foam material adjacent the ears of the patient to be pulled away for observation of the ears of the patient;

(c) a strap-restraining means for restraining the head of said patient in said foam block consisting of a strap passing around at least a portion of said foam block and over the forehead of said patient; and

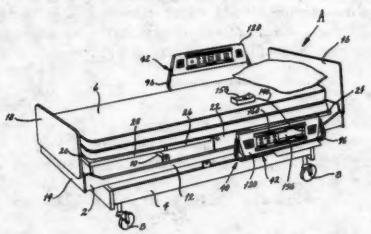
(d) patient-restraining means to immobilize the body of the patient on the surface of the board.

4,612,679

BED SIDE GUARD ASSEMBLY

Larry D. Mitchell, Manchester, Mo., assignor to Amedco Health Care Inc., St. Louis, Mo.

Filed Mar. 1, 1984, Ser. No. 584,981
Int. Cl.[4] A47C *21/08, 21/00*
U.S. Cl. 5—425 9 Claims



1. A side guard assembly for presenting a barrier along the side of a bed to prevent an occupant of the bed from rolling or otherwise falling out of the bed, said side guard assembly comprising a base; a pair of swing arms mounted on the base for rotation about parallel first axes; a lower side guard section attached to and supported on the swing arms remote from the first axes such that the swing arms rotate relative to the lower side guard section at parallel second axes which are parallel to

the first axes, whereby a parallel linkage arrangement is established that enables the lower side guard to move between an elevated position and a depressed position in a plane that is perpendicular to the first and second axes; and an upper side guard section mounted on the lower side guard section for movement between extended and retracted positions, the upper section when in its extended position extending above the lower section, the upper section when in its lower position extending substantially no higher than the lower section and being contained generally within the lower section.

4,612,680

COVER JOINT AND ARMOR FOR BRIDGE CABLE

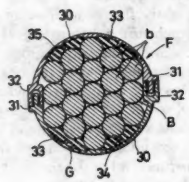
Hisashi Daiguji, Osaka, Japan, assignor to Harumoto Iron Works Co., Ltd., Osaka, Japan

Filed Feb. 14, 1985, Ser. No. 701,911

Claims priority, application Japan, Mar. 26, 1984, 59-44559[U]

Int. Cl.⁴ E01D *19/10*

U.S. Cl. 14—22 **2 Claims**



1. An armor for a bridge cable comprising:

a plurality of trough-shaped covers, each of which has a first side edge and a second side edge which extend in a longitudinal direction, said covers having inner surfaces for covering a bridge cable formed of bundles of PC steel wires;

each of said covers having a male fitting part provided on said first side edge and a female fitting part provided on said second side edge, said male fitting part of one of said covers and said female fitting part of another of said covers being fitted together for covering a bridge cable;

protrusions formed on said inner surfaces of said covers, each of said protrusions extending in said longitudinal direction;

at least one elastic spacer having grooves on an inner surface thereof for maintaining the bundles of PC steel wires in a mass shape, said elastic spacer having a groove on an outer surface thereof which extends in said longitudinal direction and is adapted to receive one of said protrusions formed on said inner surfaces of said covers.

4,612,681

DRAGLINE SWEEPER

P. Jay McKinney, Barberton, Ohio, assignor to Roadway Express, Inc., Akron, Ohio

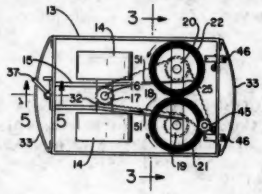
Filed Jan. 31, 1985, Ser. No. 697,112

Int. Cl.⁴ A47L *11/24*

U.S. Cl. 15—49 R **3 Claims**

1. An apparatus for cleaning the path of an endless conveyor for carts associated with the floor of a storage area, comprising:

a wheel mounted carriage attachable to said conveyor and containing a pair of counter rotatable cleaning brushes, a pair of drive wheels and a means to attach and detach the carriage to the conveyor, said cleaning brushes being mounted within said carriage essentially horizontally and being adjustably loaded by an adjustable load means to contact the floor, said pair of drive wheels being rotated



by movement of the carriage to turn a means connected to a means to rotate said brushes counter to each other.

4,612,682

APPARATUS FOR TREATING MEAT

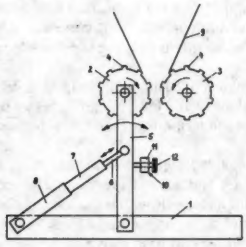
Ernst Holz, Heidenheim, Fed. Rep. of Germany, assignor to Holac Maschinenbau GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 671,105

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3344284

Int. Cl.⁴ A22C *9/00*

U.S. Cl. 17—26 **2 Claims**



1. In a system for preparing cured meat products in which a meat product is subjected to a pretreatment preparatory to being injected with a brine solution and subjected to an after treatment for absorbing said brine solution into said meat product, the improved pretreatment means for facilitating the injection of said brine solution into, and the absorption thereof by, said meat product which comprises: a frame to which is affixed at least one frame section for mounting a first removable pressure roller; at least one arm pivotally connected to said frame for mounting a second removable pressure roller in parallel relationship to said first roller thereby providing a gap between said rollers through which said meat product can be passed; a pneumatic cylinder pivotally connected at its one end to said frame and at its other end by its piston rod to said arm whereby said second roller can be displaced with respect to said first roller in response to the size of the meat product passing through said gap; means associated with said frame for establishing an adjustable maximum distance through which said second roller can be displaced towards said first roller thereby establishing a minimum dimension to said gap, said means comprising a cross member rigidly secured to said frame on which is provided an adjustable stop means adapted to contact said arm at the selected point of maximum displacement of said second roller towards said first roller; projections in the form of ribs of rectangular cross-sectional shape covering essentially the circumferential surface of each roller; means for rotating said rollers in opposite directions; and means for directing a meat product into and through the gap between said oppositely

rotating rollers whereby the pressure of the circumferential ribs of said rollers on the meat product as it traverses the gap crushes the muscle fibers and tears apart and opens the protein cells thereof, thereby facilitating the subsequent injection of brine solution into, and absorption thereof by, said meat product.

4,612,683

APPARATUS FOR PRESSURE-TREATING MEAT

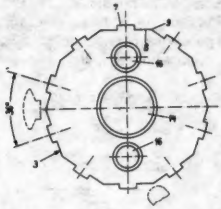
Ernst Holz, Heidenheim, Fed. Rep. of Germany, assignor to Holac Maschinenbau GmbH, Heidenheim, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,619

Claims priority, application Fed. Rep. of Germany, May 21, 1984, 3418850

Int. Cl.⁴ A22C *9/00, 7/00*

U.S. Cl. 17—26 **8 Claims**



1. An apparatus for pressure-treating meat before the introduction of curing, pickling or sousing brine therein which comprises a housing supporting two opposed, rotatable pressure rollers; a plurality of grooves spaced around the circumference of at least one of said rollers each of which grooves extends substantially the length of said roller thereby providing a series of alternating grooves and studs around the circumference of said roller each of which extends substantially the length thereof, each of said grooves being formed by a bottom surface joining two side surfaces constituted by the sides of adjacent studs, the center of said bottom surface being higher than its junctions with said side surfaces thereby giving to said bottom surface a gabled configuration when said roller is viewed in transverse cross section, the radius of the circle passing through the centers of said bottom surfaces being about 0.5–5.0 mm shorter than the radius of the circle passing through the surfaces of said studs.

4,612,684

PROCESS AND APPARATUS FOR STRINGING LINK SAUSAGES MANUFACTURED ON AUTOMATIC STUFFING MACHINES ONTO CURING AND COOKING STICKS

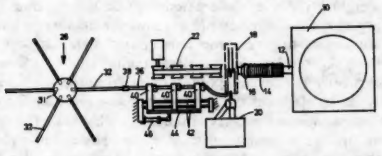
Günter Kollross, Am Wallerstädter Weg 20, 6080 Gross-Gerau Dornheim, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,332

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322759

Int. Cl.⁴ A22C *15/00, 11/12*

U.S. Cl. 17—45 **19 Claims**



1. A method for stringing of link sausages manufactured by automatic stuffing machines, on curing or cooking sticks with the aid of suspension elements which, after filling, and during closing of the stuffed sausage casing section, individually, are placed in the path of a clamping means for closing and are secured to the link sausage by the latter, characterized by seizing the suspension elements with a guide member as the suspension elements are placed in the path of the clamping means, and feeding the suspension elements, along with the sausage tied thereto onto the curing or cooking stick.

8. An apparatus for stringing of link sausages manufactured by automatic stuffing machines in conjunction with a constricting means disposed in the vicinity of a charging tube opening of the automatic stuffing machine, associated to which is an apparatus for individually feeding pre-manufactured, opened suspension loops into the path of movement of one of the constricting tools, characterized by a gripping means positioned to be introduced into the suspension loop as the loop is fed along with the constricting tool, which gripping means forms a part of a guiding means for transferring the suspension loop with the sausage secured thereto to a curing or cooking stick.

4,612,685

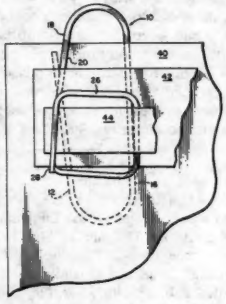
ORGANIZER CLIP DEVICE

Calvin E. Sanders, P.O. Box 1246, Keaau, Hi. 96749

Filed Jun. 19, 1985, Ser. No. 746,505

Int. Cl.⁴ B42F *1/02*

U.S. Cl. 24—67.9 **15 Claims**



1. A clip device for retaining and organizing articles in separate portions, allowing removal of one article without disturbing another, formed from a single, continuous length of multiply bent resilient material to define a plurality of loops, comprising:

(a) a first leg extending a first distance in a first direction from one end of the resilient material;

(b) a first generally arcuate portion extending from said first leg;

(c) a second leg extending from said arcuate portion a second distance in a second direction substantially opposite said first direction;

(d) a second generally arcuate portion extending from said second leg;

(e) a third leg extending from said second arcuate portion a third distance substantially in said first direction;

(f) a first rectangular loop portion extending from said third leg;

(g) a fourth leg extending from said first rectangular loop portion a fourth distance substantially in said second direction;

(h) a second rectangular loop portion extending from said fourth let;

(i) a first leg extending from said second rectangular loop a first distance substantially in said first direction;

(j) wherein said rectangular loop portions can be reversed to restore the clip device to its original tension.

4,612,686

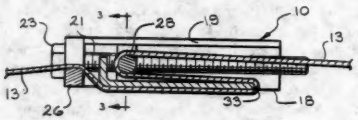
STRAP TIGHTENER

Thomas Bowers, Toledo, Ohio, assignor to Arthur Bollinger, Toledo, Ohio; Fred C. Durst, Jr. , Foreside, Me. and Emch, Schaffer, Schaub & Porcello Co., Toledo, Ohio

Filed Aug. 13, 1984, Ser. No. 640,136

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—71.1 7 Claims



1. A strap tightener for tightening a length of strap intermediate its ends comprising, in combination, a longitudinally extending base member, opposed guide walls defined on opposed sides of said base member, two longitudinally extending threaded members positioned adjacent said guide walls, said guide walls receiving and guiding said threaded member, a drive member connected to and extending between said threaded members, and a keeper means adjacent said base member and positioned immovably relative to said base member for maintaining said base member generally parallel to the length of strap, said keeper means comprising a keeper bar extending between said longitudinally extending threaded members, said keeper bar defining opposed openings for receiving said threaded members, said base member and said keeper bar defining a recess for receiving such strap, said drive member being moved along said base to tighten such strap.

4,612,687

HARNESS FASTENERS

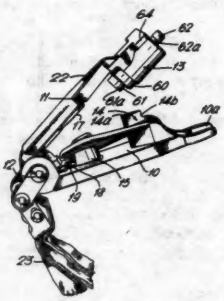
Anthony J. Barwood, Kings Lynn, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 25, 1985, Ser. No. 704,598

Claims priority, application United Kingdom, Feb. 29, 1984, 8405249

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—574 13 Claims



1. A quick release fastener for use in conjunction with a harness system having,

a base plate,

a harness lug retaining boss protruding therefrom,

a cover plate for covering the base plate,

said cover plate being pivotally connected to said base plate and moveable between locked and unlocked positions,

said cover plate when in the locked position being arranged to cover the free end of the boss so as to prevent harness lugs from being dislodged from the retaining boss, and releasable locking means for releasably holding the cover plate to the base plate over the free end of the boss, said releasable locking means including means requiring at least two different simultaneous directions of movement to effect release of the locking means.

4,612,688

PROCESS FOR MAKING SUEDE-LIKE SHEET MATERIAL

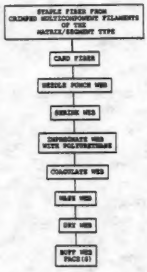
Klaus Gerlach, Aschaffenburg; Nikolaus Mathes, Breuberg; Hans-Jurgen Pitowski, Miltenberg, and Friedbert Wechs, Worth am Main, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Enka, N.C.

Continuation of Ser. No. 381,995, May 25, 1982, abandoned, which is a division of Ser. No. 217,067, Dec. 16, 1980, Pat. No. 4,342,801. This application Mar. 21, 1985, Ser. No. 714,408

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951307

Int. Cl.[4] D04H *1/46*

U.S. Cl. 28—104 13 Claims



1. A process fior the manufacture of a suede-like textile sheet structure, comprising the steps of:

(a) making a web of staple fibers formed by mechanically crimping multicomponent filaments of the matrix/segment type, said filaments having a cross-section comprising a matrix component and at least six (6) peripheral wedge-shaped or lenticular segment components which are not fully embedded in the matrix component, said matrix and peripheral components having a shrinkage differential greater than 10%;

(b) strengthening said web by mechanical bonding treatment, including fluid jet or needle punching;

(c) shrinking the web while under minimal tension to obtain an area shrinkage greater than 30% while maintaining the thickness of the web substantially constant, thereby increasing the pile density and partially dividing the fibers into their components;

(d) impregnating the web with a solution of a polyurethane based on polyglycol and diisocyanates and low molecular weight glycols as chain extender, said polyurethane having a gel formation temperature higher than room temperature, said impregnation temperature being higher than the polyurethane gel formation temperature;

(e) squeezing off excess polyurethane from the web, leaving 100% to 500% of the polyurethane solution on the web;

(f) increasing the viscosity of the polyurethane on the web in an air zone at room temperature to initiate coagulation and then passing the polyurethane coated web through a coagulation bath having a temperature lower than the gel point of the polyurethane, said coagulation bath containing a

polyurethane nonsolvent to form a microporous polyurethane and minimize adhesion between the polyurethane and fiber whereby less than 70% of the surface of the fiber is firmly bonded to the polyurethane; and

(g) thereafter washing and drying said web and buffing at least one side.

4,612,689

METHOD OF MANUFACTURING MULTILAYER CAPACITORS

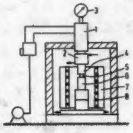
Willem R. de Wild; Gijsbertus de With, and Henricus C. Smulders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,219

Claims priority, application Netherlands, Oct. 7, 1983, 8303447

Int. Cl.[4] H01G *7/00*

U.S. Cl. 29—25.42 **6 Claims**



1. A method of manufacturing multilayer capacitors composed of alternate layers of a dielectric oxidic ceramic material and of an electrode material which have been formed into an integral body as a result of the application of pressure at an elevated temperature, characterized by the following steps: forming dielectric foils comprising a mixture of a organic binder with an oxidic ceramic powder;

stacking said foils alternately with layers of electrically conductive material which function as electrodes;

pressure-sintering the stack by heating the stack to a previously determined temperature below the atmospheric pressure sintering temperature of the oxidic ceramic powder while simultaneously applying a uniaxial pressure in the direction of stacking so as to form an integral body;

releasing the pressure and cooling; and

severing the unit into individual capacitor bodies.

4,612,690

MULTIPLE SPINDLE MACHINE TOOL

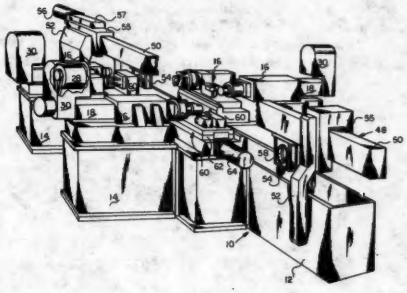
Gary L. Baker, Portland, Mich., assignor to Crankshaft Machine Company, Jackson, Mich.

Filed Dec. 24, 1984, Ser. No. 685,483

Int. Cl.[4] B23Q *7/00*

U.S. Cl. 29—33 P **9 Claims**

1. A multiple spindle machine tool comprising, in combination an integral base having a longitudinal axis defined by a transfer region and at least two lateral sections extending from said transfer region, a rotating self-loading spindle assembly mounted upon each lateral section each having an axis of rotation and axial direction of operative linear translation transverse to said base axis for axial movement between a workpiece transfer position and a workpiece machining position, releasable workpiece holding means defined on said spindles' assemblies, said lateral sections being spaced from each other along said base axis, workpiece transfer means mounted upon said base transfer region including linearly movable carriers having a direction of movement parallel to said base axis whereby a workpiece may be sequentially transferred along said base axis from alignment with one spindle assembly axis to the other, said carriers being in alignment with a spindle assembly axis at said assembly workpiece transfer position whereby said workpiece holding means is disposed adjacent a carrier when said assembly is in said workpiece transfer position, and workpiece machining means mounted on said lateral sections for machining the workpiece when said assembly is in said workpiece machining position.



4,612,691

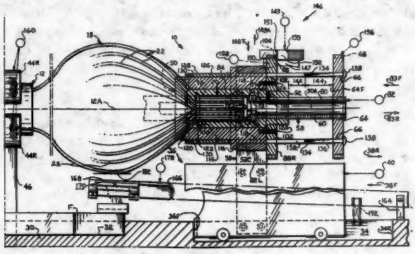
MANAGEMENT APPARATUS FOR A CABLE HAVING PLURAL CONDUCTORS ARRANGED IN ONE OR MORE LAYERED ARRAYS

Paul W. Aikens, Etters, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1984, Ser. No. 685,027

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—33 R **16 Claims**



1. Apparatus for separating the individual conductors of a cable arranged as a multi-conductor array comprising:

a gripping assembly for gripping the exterior of the array at a predetermined point spaced from the axial ends of the conductors;

a member having an abutment surface thereon engageable against the axial ends of the individual conductors of the array;

an actuator for displacing the abutment surface along the axis of the cable toward the gripping assembly thereby bowing the conductors between their axial ends and the gripping assembly to form a buckled array thereof in which each individual conductor is buckled outwardly from the axis of the cable;

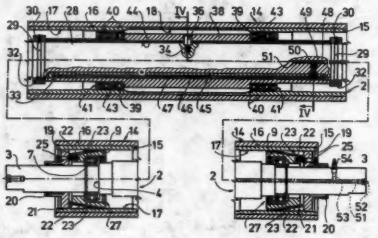
a rotator assembly for rotating each conductor in the buckled array past a predetermined reference position; and

a finger for grasping each conductor when it is disposed at the reference position and transposing it to a different position.

4,612,692
PRESSURE CYLINDER WITH VARIABLE CONFIGURATION AXIS

Bruno Molinatto, Montalto Dora, Italy, assignor to Componenti Grafici s.r.l., Candia Lomellina, Italy

Continuation of Ser. No. 268,473, May 29, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,351
Claims priority, application Italy, Jun. 19, 1980, 67958 A/80
Int. Cl.⁴ B21B *13/02*
U.S. Cl. 29—116 AD **4 Claims**



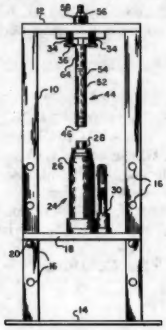
1. A printing machine cylinder (1) comprising a stationary central shaft (2) having an intermediate portion (28) and end portions (3); a hollow outer roll (14) surrounding and spaced from said central shaft (2), first bearing means (7) on said end portions of said central shaft rotatably supporting said outer roll on said central shaft; said hollow outer roll having an inner tubular jacket (15) having its inner cylindrical surface (17) formed with a recessed central portion (18), a resilient tubular sleeve (16) surrounding and in contact with the exterior surface of said inner tubular jacket; a bush (33) having an eccentric axial bore (44) mounted with radial play on said intermediate portion (28) of said central shaft (2) and within said hollow outer roll (14), said bush having a central portion (38) with an enlarged diameter relative to its ends, means axially and angularly fixing said bush (33) with respect to the said central shaft (2) so that said enlarged diameter central portion is radially aligned with said recessed central portion on the inner cylindrical surface of said outer roll, bearings means (43) between the outer surface of said bush (33) and inner cylindrical surface (17) of said hollow outer roll (14), said second bearing means being located at the ends of said enlarged diameter central portion of said bush and said recessed central portion on the inner cylindrical surface of said hollow outer roll; and deformable means (47) which can be dilated by a pressurized fluid interposed between said bush (33) and said shaft (2).

4,612,693
HYDRAULIC SERVICING APPARATUS

James E. Beeler, 7400 Wellman Rd., Parma, Mich. 49269

Filed Oct. 9, 1984, Ser. No. 658,797
Int. Cl.⁴ B23P *19/02*
U.S. Cl. 29—251 **4 Claims**

1. A press characterized by its economy of construction and ease of operation comprising, in combination, a frame comprising a pair of spaced, parallel, vertically disposed columns having upper and lower ends, a top plate interconnecting said columns' upper ends having a lower surface, a base plate interconnecting said columns' lower ends, a jack support plate bridging said columns, vertically adjustable jack support plate mounting means defined upon said columns, a hydraulic jack mounted upon said jack support plate having a piston defining a vertical axis of operation, part anvil means defined upon said top plate adapted to engage a part to which force is applied thereto by said jack, said anvil means including a vertical axis in alignment with said jack axis, a pair of independently operated vertically adjustable stops mounted upon said top plate on opposite sides of said anvil axis and extending through said top plate lower surface toward said jack support plate, said stops each comprising threaded shafts having lower ends and a part engaging pad defined upon said lower end of said shafts, an opening defined in said top plate in alignment with said anvil

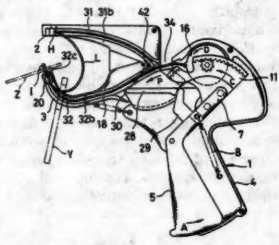


means axis, and a compression rod received within said opening for vertical movement therein, said rod having a lower region having a lower end engagable by said jack piston.

4,612,694
METHOD OF CONNECTING ENDS OF FILAMENTARY FASTENER

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan

Division of Ser. No. 571,538, Jan. 17, 1984, Pat. No. 4,536,933. This application Jul. 24, 1985, Ser. No. 758,537
Claims priority, application Japan, Jan. 31, 1983, 58-12996
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—450 **2 Claims**



1. A method for connecting the pin end to the socket end of a fastener having a filament portion of predetermined length with a pin end on one end thereof and socket end on the other end thereof, using an apparatus comprising a main body, a first arm having a first guide groove therein and connected at one end thereof to said main body, a first fixing portion disposed on the end of said first arm opposite the end connected to said main body, a second arm rockably secured at one end thereof to said first arm, a flexible member disposed within said main body and being shaped so as to be guided by said first and second guide grooves when directed theretoward, and clamping means provided on an end of said flexible member for clamping either the pin end or the socket end of a fastener, the method comprising the steps of:

guiding the socket end of a fastener through said first guide means until the socket end is positioned at the end of said first arm distal from said main body;

guiding the pin end of the same fastener through said second guide means until the pin end is positioned at the end of said second arm distal from the end secured to said first arm; and

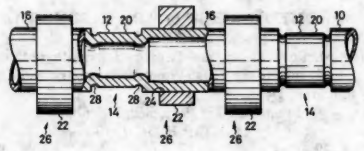
bringing said second arm close enough to said first arm to cause the pin end of the fastener to be inserted in the socket end thereof.

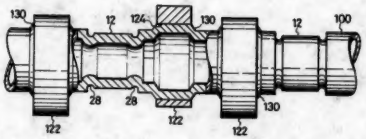
4,612,695

METHOD OF MANUFACTURING A HOLLOW CAM SHAFT

Genkichi Umeha, Tokyo; Yoshiaki Fujita, and Atsushi Shimura, both of Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,937
Claims priority, application Japan, Jan. 20, 1984, 59-7033
Int. Cl.[4] B21D *39/00*; B23P *11/00*
U.S. Cl. 29—505 **14 Claims**





1. A method of manufacturing a hollow cam shaft comprising the steps of:

a. selecting a hollow metal pipe member having an outside diameter and a longitudinal axis;

b. forming a journal portion in the pipe member at at least one location along the pipe axis, said journal portion forming step including the substep of inwardly deforming a portion of the pipe member at said one location, the inwardly deformed pipe member portion having a bearing surface with an outside diameter less than the undeformed pipe outside diameter; and

c. mounting at least one cam member on the pipe member at a location different from said one location, said cam member of the type having a fitting hole, said mounting step including the substeps of

(1) selecting a cam member having a fitting hole sized for the outside diameter of the pipe member at said different location,

(2) fitting the cam member on the pipe member at said different location, and

(3) fixedly connecting the cam to the pipe member at said different location.

11. A method of manufacturing a hollow cam shaft comprising the steps of:

a. selecting a hollow metal pipe member having an outside diameter and a longitudinal axis;

b. forming a journal portion in said pipe member at at least one location along the pipe axis, said journal portion forming step including the substep of inwardly deforming a portion of the pipe member at said selected location, the inwardly deformed pipe member portion having a bearing surface with an outside diameter less than the undeformed pipe outside diameter;

c. forming a mounting surface at at least one location different from said selected location for mounting a cam member, said mounting surface forming step including the substep of outwardly deforming the portion of the pipe member at said different location the outside diameter of said outwardly deformed pipe portion being made greater than the undeformed pipe outside diameter; and

d. mounting a cam member of the type having a fitting hole on the pipe member, said mounting step including the substeps of

(1) selecting a cam member having a fitting hole sized for the outside diameter of the outwardly deformed pipe portion,

(2) fitting the cam member on the outwardly deformed pipe portion, and

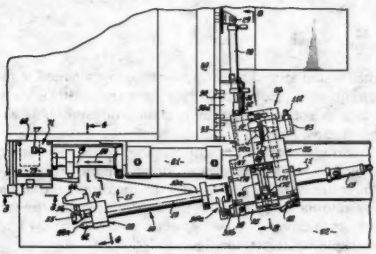
(3) fixedly connecting the cam member to the outwardly deformed pipe portion.

4,612,696

ROBOT APPARATUS FOR HANDLING WIRE WORKPIECE DURING TERMINATION

Lloyd A. Talley, Valinda, Calif., assignor to Eubanks Engineering Co., Monrovia, Calif.

Filed Feb. 15, 1985, Ser. No. 702,146
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—564.4 **23 Claims**



1. Wire section handling apparatus, for use with separately supported wire section terminating means, comprising

(a) an arm, means supporting the arm for pivotal displacement between first and second positions, and means to pivot the arm,

(b) a head on the arm including a clamp to grip the wire section when the arm has been pivotally displaced to said first position, so that the wire section may be transported by the arm to said second position,

(c) the head having a guide thereon adapted to telescopically interfit a locating guide at said second position, thereby to accurately locate the wire section for termination thereof,

(d) means to extend the arm in said second position to effect said telescopic interfit, and position the wire section for termination,

(e) whereby the arm may subsequently be retracted and the clamp unclamped, to free the wire from the arm and head.

4,612,697

AUTOMATED MACHINING SYSTEM HAVING A WORKPIECE TRANSFER APPARATUS

Kenneth J. Palfery, Toronto; Kenrick B. Maharaj, Brampton; John S. Malcom, Schomberg; Donald R. Puckering, Georgetown, and Kee-Shong Wong, Brampton, all of Canada, assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 14, 1984, Ser. No. 681,794
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **2 Claims**

1. An automated machine tool, comprising;

(a) A frame;

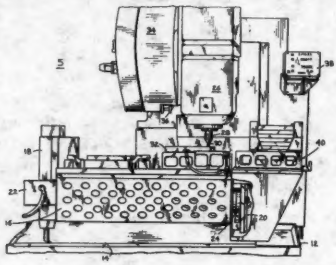
(b) A movable worktable means connected to the frame for supporting a workpiece and movable longitudinally and latitudinally to position the workpiece at a desired point in a horizontal plane;

(c) A rotatable spindle means mounted on a drive head and

vertically movable relative to the frame for supporting and rotating a cutting tool at a predetermined speed rate to machine the workpiece;

(d) A tool changing means connected to the frame for storing tools and exchanging the tool supported in the rotatable spindle means with one of a multitude of different tools stored therein;

(e) A material handling means having a workpiece pick-up means adapted to be supported in the rotatable spindle



means and stored in the tool-changing means for picking up the workpiece and allowing the transport of the workpiece to a second machining station on a movable worktable means; and

(f) A programmable control means disposed to control the movable worktable means, the rotatable spindle means, the tool changing means, and the material handling means for automatically loading the workpiece onto the worktable, machining the workpiece, and selection of a new workpiece for machining.

4,612,698

METHOD OF FABRICATING SOLAR CELLS

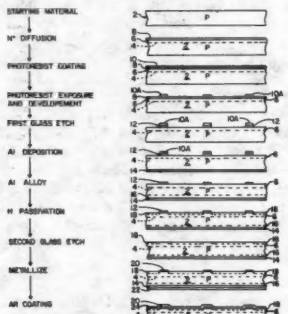
Ronald C. Gonsiorawski, Danvers, and Douglas A. Yates, Burlington, both of Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 666,972, Oct. 31, 1984, abandoned, which is a continuation of Ser. No. 563,292, Dec. 19, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,001

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.[4] H01L *31/18*

U.S. Cl. 29—572 **16 Claims**



1. A method of fabricating solid state semiconductor devices comprising in sequence the steps of:

(a) providing a silicon substrate having opposing first and second surfaces and having on said first surface a mask in the form of a surface layer with a predetermined two-dimensional pattern therethrough exposing selected portions of said first surface;

(b) exposing said first surface to a hydrogen ion beam of an intensity and for a duration sufficient to form a surface layer on said selected exposed portions of said first surface to which metals will only poorly adhere;

(c) removing said mask; and

(d) subjecting said first surface to metal plating so that a metal layer is formed on all portions of said first surface other than said selected exposed portions.

3. Method according to claim 1 wherein said devices are photovoltaic.

4,612,699

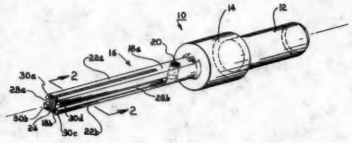
PRINTED CIRCUIT BOARD FABRICATION APPARATUS

Charles M. Lovendusky, and Gregory G. White, both of Enola, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 12, 1984, Ser. No. 660,571

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—739 **8 Claims**



1. An anvil for supporting a printed circuit board during insertion of a terminal through the printed circuit board comprising:

a forked member having two elongated, laterally spaced tines, said tines having parallel, spaced, inner, terminal-pinching surfaces at their board-engaging free ends, said free ends of the tines running surfaces for supporting the printed circuit board said terminal pinching surfaces for receiving and pinching the end of a terminal inserted through the printed circuit board between said spaced surfaces of the tines, and means mounted in the forked member for electrically sensing the presence of a pinched terminal, said tines each having a longitudinal groove in its exterior surface, said grooves being substantially coextensive in length with the tines.

4,612,700

COMPONENT INSERTION APPARATUS

Phillip E. Loomis, Harrisburg; Edward J. Paukovits, Jr., Hummelstown; Leo V. Schuppert, Jr., York, and Richard V. Spong, Etters, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 26, 1985, Ser. No. 727,708

Int. Cl.[4] H05K *13/04*

U.S. Cl. 29—564.6 **16 Claims**

1. Apparatus for selectively severing components from a plurality of strips of components and inserting each severed component into a workpiece, the apparatus comprising:

a frame;

component strip severing means and associated component insertion means on the frame;

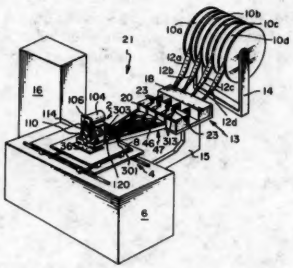
a row of component strip feed units each for receiving one of the strips, arranged on the frame for movement lengthwise of the row and each having means for feeding said one strip along a feed path extending transversely of the row and with a component of the strip leading;

means connected to the frame for moving said row of units to bring the feed path of a selected one of said units at a

time, into alignment with said strip severing means and said component insertion means;

first actuating means on the frame for actuating the feeding means of each selected unit to feed the leading component of the strip pertaining thereto to the severing means and the insertion means; and

second actuating means on the frame for actuating the severing means and the insertion means to sever such leading component from its strip and then to insert it into the workpiece, and wherein each strip feed unit is movable transversely of said row, between a first position in line with the remaining strip feed units to allow a desired strip feed unit to be selected, and a feed position in which the strip feed means of the selected strip feed unit is actuable by said first actuating means to feed its strip.



4,612,701

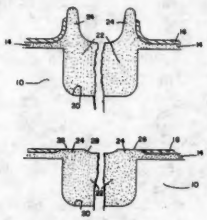
METHOD TO REDUCE THE HEIGHT OF THE BIRD'S HEAD IN OXIDE ISOLATED PROCESSES

Eugene R. Cox, Puyallup, Wash., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 12, 1984, Ser. No. 588,727

Int. Cl.[4] H01L *21/94, 21/95*

U.S. Cl. 29—576 W **13 Claims**



5. A method of forming an oxide in a semiconductor substrate comprising:

forming an oxide inhibiting mask on a semiconductor substrate;

forming an opening in said mask exposing portions of said substrate;

removing a portion of said exposed substrate to form a recess;

oxidizing said exposed portions of said substrate; and

grinding portions of said oxidized substrate which extends above said mask down to a plane using said mask as a polishing stop.

4,612,702

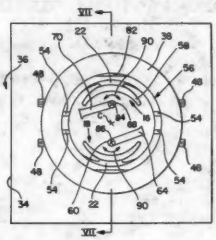
FIELD COIL WINDING

Dale K. Wheeler, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Filed May 22, 1985, Ser. No. 737,104

Int. Cl.[4] H02K *15/00, 15/06*

U.S. Cl. 29—596 **28 Claims**



1. A method of manufacturing a stator assembly of an electric motor, comprising the steps of:

positioning a hollow stator body relative to a wire feeding member, said hollow stator body defining an armature axis about which in the electric motor an armature rotates;

reciprocating the wire feeding member relative to said stator body through successive stokes along a second axis extending internally through said stator body eccentrically of said armature axis;

partially rotating said wire feeding member relative to said stator body about said second axis during said strokes; and

emitting a wire from said wire feeding member during said reciporcating and rotating to wind said wire around an internal pole piece of said stator body to form a field coil, said were being wound directly around said pole piece without the employment of temporarily positioned winding forms.

4,612,703

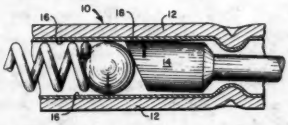
PRODUCTION OF METAL-PLATED AREAS ON SELECTED INTERIOR PORTIONS OF DEEP-DRAWN TUBULAR PARTS

James S. Cooney, Attleboro, Mass., assignor to Pylon Company, Inc., Attleboro Falls, Mass.

Filed Mar. 18, 1985, Ser. No. 712,615

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—885 **6 Claims**



1. A method for producing a metal tube from which the body of a plunger-type electrical contact is to be made, said tube having a coating of a different metal on selected portions of its inner surface, the method comprising:

coating a flat piece of a first metal, from which said tube is to be made, with a predetermined pattern of a second metal on at least one preselected portion of the surface of said flat piece, said portion being less than the total surface of said flat piece and corresponding ultimately to the portion of the interior of the electrical contact body which comes into sliding contact with the end of the contact plunger; and

deep drawing said flat piece to form a tube, said piece being oriented in the die employed in said deep drawing opera-

tion such that said second metal coating is on the inside of the resulting tubular structure;

whereby a tube possessing a coating of said second metal in a predetermined pattern on at least one preselected portion of its inner surface is formed.

4,612,704

WET-SHAVING UNIT WITH HANDLE FORMING SEATS FOR SHAVING HEADS

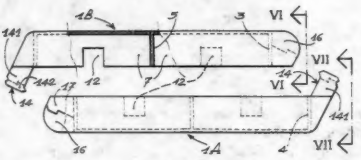
Giorgio Berretti, Via di Pitigliolo 122, Strada in Chianti, Greve, Firenze, Italy 50022

Filed Dec. 28, 1984, Ser. No. 687,267

Claims priority, application Italy, Jan. 24, 1984, 9317 A/84

Int. Cl.[4] B26B *21/00*

U.S. Cl. 30—47 **5 Claims**



1. A compact shaving unit comprising a pair of overturned oppositely disposed handles in mutual and detachable engagement with respect to each other, each of said handles having a top portion defining a razor head seat for receiving a razor head and a bottom portion defining a head seat receiving means, and wherein each of said razor handles is configured as a U-shaped channel, each of said U-shaped channels having a bottom wall, two side walls, and an open top;

said U-shaped channel being dimensioned such that when the two handles are oppositely disposed in mutual and detachable engagement to form the compact shaving unit during non-use, the open top of the U-shaped channel of each handle faces the other;

each of said U-shaped channels having a plurality of transverse separating walls, which define a plurality of head-receiving storage chambers, each of which detachably retains a razor head for storage,

the mutual and detachable engagement being such that the head seat of each handle engages the corresponding head seat-receiving means of the other handle,

whereby said releasably engaged handles are maintained as a single compact unit.

4,612,705

OPEN RAZOR

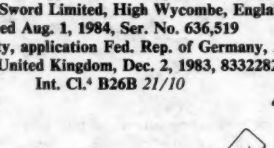
Wolfgang Althaus, Wuppertal, Fed. Rep. of Germany, assignor to Wilkinson Sword Limited, High Wycombe, England

Filed Aug. 1, 1984, Ser. No. 636,519

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330477; United Kingdom, Dec. 2, 1983, 8332282

Int. Cl.[4] B26B *21/10*

U.S. Cl. 30—53 **4 Claims**



1. An open razor comprising a blade holder, a protective cover, and pivot means pivotally interconnecting the blade holder and cover to permit the holder and cover to be folded between an open position and a closed position about a common pivot axis, the blade holder comprising a supporting rail and a replaceable blade unit, the rail and blade unit being shaped relative to one another to permit the unit to be fitted to or removed from the rail, said blade unit having a razor blade permanently secured therein, said blade unit extending beyond the outermost end of said rail when the unit is fitted thereto, wherein the blade unit is provided with longitudinal grooves in its opposite sides which extend parallel to the cutting edge of the blade, and the rail has inwardly directed sides which engage the grooves when the blade unit is pushed longitudinally on to the rail.

4,612,706

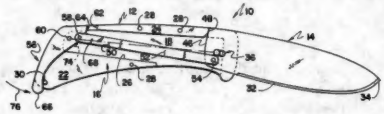
FOLDING KNIFE

Yamil R. Yunes, P.O. Box 573, Roma, Tex. 78584

Filed Sep. 24, 1984, Ser. No. 653,553

Int. Cl.[4] B26B *3/06*

U.S. Cl. 30—160 **9 Claims**



1. A folding knife comprising

a handle, a blade and means pivotally connecting the blade to the handle for rotation, about a first axis, for movement between a first extended postion in which the blade and handle abut, a second intermediate position and a third collapsed position; and

toggle means enabling blade movement from the second position to the first position and for locking the blade against the handle in the first position including

an operating lever pivotally connected to the handle for rotation about a second axis, the first and second axes defining an imaginary line therebetween; and

a link pivotally connected at a first location to the lever and at a second location to the blade for movement between a second unlocked position, corresponding to the second blade position, in which both locations reside on the same side of the imaginary line and a first locked position, corresponding to the first blade position, in which the first and second locations are on opposite sides of the imaginary line, the link and the operating lever defining an over-center toggle in the extended position of the blade.

4,612,707

CUTTING AND SCRAPING DEVICE

Thomas M. Shea, 1865 Harvest La., Bloomfield Hills, Mich. 48013

Filed Mar. 29, 1984, Ser. No. 594,553

Int. Cl.[4] B26B *5/00, 29/02*

U.S. Cl. 30—162 **10 Claims**

1. A device to be held in the hand to cut and/or scrape, said device comprising:

a handle portion and a base portion;

said handle portion and said base portion being integrally joined;

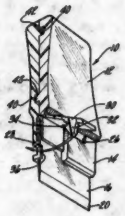
a blade having a longitudinal cutting edge and a centrally disposed through opening;

means provided in said base portion for longitudinally receiving said blade and positioning said cutting edge in a position spaced from said base portion;

means for selectively locking said blade to said base portion;

said last mentioned means comprising a locking member hingedly mounted to said handle portion, said base portion

having a through opening which coincides with said central through opening of said blade when said blade is in a proper position with respect to said base portion and said locking member including a portion extending through said openings of said blade and said base portion to lock said blade to said base portion; and



wherein said locking member comprises means for urging said extending portion through said openings of said blade and said base portion whereby said locking member must be pulled away from and out of said openings to release said blade from said slot.

4,612,708

REPLACEABLE BLADE TYPE MEDICAL SCISSORS

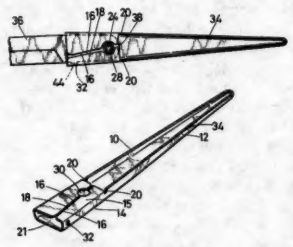
Katsura Hattori, 1-13, Eikin-cho, Syouwa-ku, Nagoya-City, Aichi-Prefecture, Japan

Filed Mar. 12, 1985, Ser. No. 711,015

Claims priority, application Japan, Mar. 15, 1984, 59-37921[U]

Int. Cl.⁴ B26B *13/04*

U.S. Cl. 30—260 **1 Claim**



1. Exchangeable blade type medical scissors comprising:

a pair of scissors bodies;

a pair of replaceable blades each of which is composed of a blade portion made of a metal plate which is bent such as to have an arcuate cross section, and a retaining portion which is constituted by said metal plate bent into an envelope form which gradually increases in width towards the base portion;

notch means adapted to allow plastic deformation and integrally provided at the base portion of said blade portion;

a pair of insertion pieces which are respectively provided at the end portion of each of said scissor bodies and each of which is inserted into said retaining portion of said replaceable blade such that said scissor body is removably secured to said replaceable blade by the elastic contracting force of said retaining portion;

a connecting pin which connects said pair of scissor bodies at said retaining portions of said replaceable blades;

protrusions provided on one of either of said retaining portions of said replaceable blades or said insertion pieces of said scissor bodies, and on the other, engaging holes provided so that said replaceable blades may be prevented from slipping off said scissor bodies by the engagement of said protrusions with said engaging holes when said replaceable blades are mounted on said scissor bodies; and

reinforcing ribs provided on the retaining portions of said replaceable blades.

4,612,709

APPARATUS FOR MEASURING POSITIONAL MOVEMENT OF A NUMERICALLY CONTROLLED MACHINE TOOL

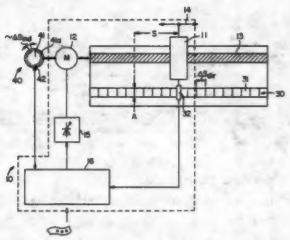
Roderich Baisch; Horst Gose, and Wolfgang Papiernik, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,246

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426863

Int. Cl.⁴ G01B *7/02*

U.S. Cl. 33—125 R **6 Claims**



1. An apparatus for measuring positional movement of a movable workpiece of a machine tool, comprising:

(a) direct position measuring means, arranged along the path of movement of the movable workpiece;

(b) indirect position measuring means, mechanically coupled to a drive of the movable workpiece and having a measuring resolution at least four times greater than the measuring resolution of said direct position measuring means; and

(c) means for relating resulting measurement values of both position measuring means with each other and for automatically determining spindle pitch and spindle pitch error of a spindle coupled to the drive so that the control accuracy of the machine tool can be improved.

4,612,710

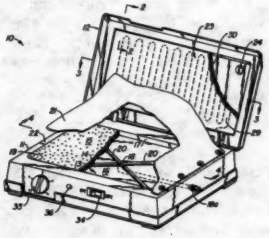
METHOD AND APPARATUS FOR DRYING GEL SLABS

George G. Fernwood, San Anselmo, and Samuel Burd, Oakland, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Sep. 20, 1984, Ser. No. 653,971

Int. Cl.⁴ F26B *7/00*

U.S. Cl. 34—16 **17 Claims**



1. Apparatus for drying a horizontally supported gel slab, comprising:

a weighted heating plate resting evenly on top of said gel slab under gravitational force and at least coextensive therewith;

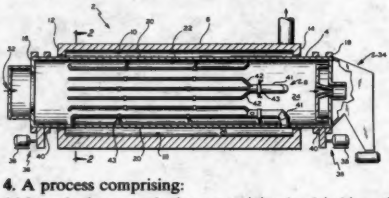
a vacuum-retaining sheet interleaved between said heating plate and said gel slab; and

means for reducing the atmospheric pressure below said gel slab in substantially uniform manner over the surface thereof to draw vaporized moisture downward from said slab.

4,612,711
APPARATUS AND METHOD FOR DRYING PARTICULATE MATERIAL

Lawrence K. Murray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 30, 1983, Ser. No. 509,540
Int. Cl.[4] F26B *3/24*
U.S. Cl. 34—39 7 Claims



4. A process comprising:

(a) introducing a particulate material to be dried into the first end of an inclined drum having an upper first end and a lower second end and a mid portion between the first end and the second end positioned in an oven having a first end and a second end;

(b) rotating the drum;

(c) circulating a first portion of hot gases in the oven around the drum;

(d) circulating a second portion of hot gases through a plurality of tubular members generally longitudinally positioned in the drum offset from a longitudinal axis of the drum and connecting to the oven near the first end of the oven and the second end of the oven, said tubular members being spaced apart from an inside surface of the drum at a distance in the range of from about 1/16 to about ¼ of a diameter of the drum, said first portion of hot gases and said second portion of hot gases being maintained in isolation from the particulate material and heating surfaces of the drum;

(e) lifting the particulate material by rotation of the drum with vanes attached to the inside of the drum and extending generally longitudinally along the inside of the drum and dropping at least a portion of the lifted particulate material onto the tubular members for indirect heat exchange with the second portion of hot gases;

(f) dropping at least a portion of the particulate material onto vanes attached to the exteriors of the plurality of tubular members for indirect heat exchange with the second portion of hot gases, a majority of said tubular-mounted vanes being arranged to extend in a direction generally normal to a radius of said drum for catching particulate material dropped on them.

4,612,712
MACHINE FOR HEATING AN ARTICLE OR PRODUCT BY VAPOR CONDENSATION

Richard Pescatore, Antibes, and Jean-Jack Boumendil, Villeneuve-Loubet, both of France, assignors to Piezo-Ceram Electronique, Antibes, France

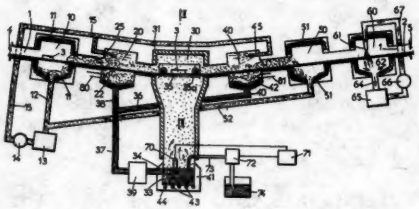
PCT No. PCT/FR84/00226, § 371 Date Jun. 11, 1985, § 102(e) Date Jun. 11, 1985, PCT Pub. No. WO85/01791, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 10, 1984, Ser. No. 745,412
Claims priority, application France, Oct. 11, 1983, 83 16113
Int. Cl.[4] F26B *15/18*
U.S. Cl. 34—68 5 Claims

1. A machine of the in-line type for heating articles or products at an elevated temperature by condensing vapor thereon, which comprises

a tunnel having an entry and an exit;

means for moving articles or products to be heated through said tunnel from said entry to said exit, and

first, second, third, fourth, and fifth chambers distinct from each other and having a cross-section greater than that of said tunnel distributed along said tunnel and in the stated order and being connected to each other by sections of said tunnel, said third chamber being adapted to be filled with vapors of a primary liquid having a boiling point which is at least equal to the elevated temperature at which said articles or products have to be heated, said second and fourth chambers being provided with means for establishing therein a body of vapors of a secondary



liquid having a boiling point lower than that of said primary liquid so as to condense any primary vapors coming from said third chamber, said first and fifth chambers being provided with cooling means for condensing any secondary vapors coming from said second and fourth chambers, respectively, and

boiler means having heating means for boiling a primary liquid in said boiler, and means for feeding said third chamber with said vapors of primary liquid;

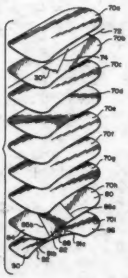
means for collecting the condensates of primary vapors formed in said second and fourth chambers and for recycling them to said boiler means, and

means for collecting the condensates of secondary vapors formed in said first and fifth chambers and for recycling them to said means for establishing the body of secondary vapors.

4,612,713
ORTHOTIC FOR ATHLETIC USE

Dennis N. Brown, 8528 Custer School Rd., Custer, Wash. 98240

Filed Apr. 3, 1985, Ser. No. 719,347
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—44 10 Claims



1. A substantially unitary orthotic insert adapted to be placed in an article of footwear, said insert having a longitudi-

nal axis parallel to a lengthwise axis of a foot for which the insert is used, and a transverse axis, said insert comprising:

a. a rear portion adapted to underlie and engage a plantar surface of a cacaneal area of the foot;

b. a forward portion adapted to underlie and engage a plantar surface of a metatarsal head area of the foot;

c. an intermediate portion connecting to and extending between said rear and forward portions to engage a plantar surface of a mid-foot area of the foot;

d. said insert having outside and inside edge portions adapted to be positioned adjacent an outside edge and an inside edge of the foot, respectively;

e. said insert having a laminated structure comprising a plurality of vertically stacked layers bonded to one another to form a substantially unitary structure, said laminated structure comprising:

1. a first laminate means comprising a plurality of generally parallel fibers having a substantial component of alignment parallel to said longitudinal axis; 2. a second laminate means comprising at least two sections, each of which is made up of a plurality of fibers generally parallel to one another, one of said sections being positioned forwardly of the other of said sections, the fibers of the one section having an orientation of alignment angled relative to an orientation of alignment of the other section.

4,612,714

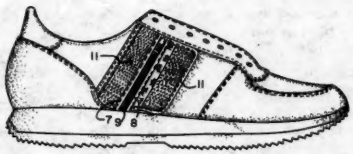
ATHLETIC SHOE POCKET WITH REAR FLAP

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., Maryland Heights, Mo.

Continuation of Ser. No. 433,460, Oct. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 314,134, Oct. 23, 1981, abandoned. This application Jul. 22, 1985, Ser. No. 757,917

Int. Cl.[4] A43B *23/00*

U.S. Cl. 36—136 **6 Claims**



1. In a pocket for an athletic shoe and designed to hold smaller size personal items such as keys, coins, or the like, comprising, such shoe having a quarter portion extending from its eyestay and securing approximate the sole shank at its lower extent, a pocket stitched to the shoe quarter along particular of its edges, there being a slot provided within said pocket to allow access to its interior for the deposit of the aforesaid type of items therein, said slot being arranged extending approximately from the upper to the lower edges of said pocket, a cover flap, said cover flap along one edge being stitched to the pocket approximately along the frontal edge of the formed pocket slot, and extending approximateLy from the eyestay to the sole shank, said cover flap disposed for also extending rearwardly and capable of folding over into contiguity overlying part of the formed shoe and pocket and providing at least its slot with coverage, said cover flap overlying a part of the formed pocket and shoe, the curvature of the shoe at the location of said cover flap pressuring said flap into a tight contiguity with the underlying shoe and pocket thereat, said pocket being integrated into the quarter portion of the shoe and also extending from the eyestay to the sole shank, said pocket being formed having a back edge thereof, and said pocket slot being disposed in proximity and in alignment with the said disposed bakc edge of the said pocket, zipper means provided upon the shoe within the region of and upon the opening of its formed pocket slot, whereby upon opening of said zipper means the identified type of items may be inserted within the pocket for safe keeping, said zipper means being arranged aligned approximately and in the vicinity with the back edges of the formed pocket, and fastening means provided upon both the cover flap and one of said shoe quarter and formed pocket and cooperating to hold the said cover flap against the said shoe during usage, and said cover flap capable of folding forwardly for exposing the zipper means and pocket slot for the insertion or removal of the identified items from within the formed pocket.

4,612,715

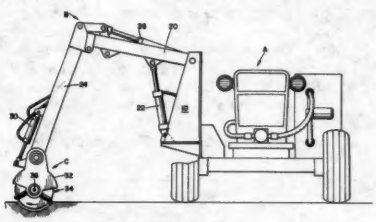
DITCHING APPARATUS WITH IMPROVED DITCHING BLADE

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Continuation of Ser. No. 416,642, Sep. 10, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,507

Int. Cl.[4] E02F *5/08*

U.S. Cl. 37—92 **15 Claims**



15. In a ditching apparatus for removing dirt and debris to shape a ditch, which ditching apparatus comprises a prime mover, an arm assembly operatively connected at a first end with the prime mover, a ditcher head operatively connected with a second end of the arm assembly, the ditcher head including a rotatably mounted support member, a motor means for rotating the support member, a plurality of paddle mounting brackets disposed generally radially on a trailing face of the support member and extending rearwardly therefrom, a plurality of paddles, each paddle being operatively connected with one of the paddle mounting brackets, a plurality of blade mounting brackets connected with a leading face of the rotary support member, the blade mounting brackets include a plurality of mounting apertures extending therethrough, a plurality of ditching blades removably fastened to the blade mounting brackets, each blade being a generally planar rectangle which is symmetric about each of three axes to be four-way reversible for fastening to the blade mounting brackets in any one of four orientations to quadruple blade life, each ditching blade including:

(a) a first and second generally planar faces disposed symmetrically relative to a face plane extending centrally therebetween;

(b) the first and second faces terminating at oppositely disposed first and second ends, the first and second ends being symmetric about an end axis which extends centrally therebetween;

(c) the first and second faces further terminating at oppositely disposed first and second edges being symmetric about an edge axis extending centrally therebetween and perpendicular to the end axis;

(d) the first and second edges, faces, and ends defining four cutting areas;

(i) a first cutting area disposed along contiguous portions of the first edge, the first face, and first end;

(ii) a second cutting area disposed along contiguous portions of the first edge, the second face, and second end;

(iii) a third cutting area disposed along contiguous por-

tions of the second edge, the first face, and second end; and,

(iv) a fourth cutting area disposed along contiguous portions of the second edge, the second face, and first end;

(e) a plurality of mounting apertures extending between the first and second faces and disposed symmetric with respect to both the end and edge axes, the blade and bracket mounting apertures being disposed relative to each other such that the blade is mountable:

(i) with the second edge along the rotatably mounted support member and the first end extending generally radially beyond the rotary support member such that the first cutting area is disposed radially and axially outermost;

(ii) with the second edge disposed along the rotatably mounted support member and the second end extending radially beyond the radial support member such that the second cutting area is disposed radially and axially outermost;

(iii) with the first edge along the rotatably mounted support member and the second end extending generally radially beyond the radial support member such that the third cutting area is disposed radially and axially outermost; and,

(iv) with the first edge disposed along the rotatably mounted support member and the first end extending radially beyond the radial support member such that the fourth cutting area is disposed radially and axially outermost;

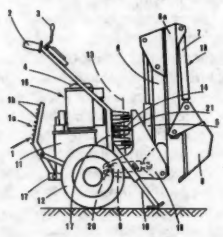
whereby each blade is selectively mountable in four positions to quadruple blade life.

4,612,716

TROLLEY MOUNTED, HAND-PROPELLED HOME/PROFESSIONAL DIGGER, OR 'MINI-DIGGER'

Vittorio Bulgarelli, Ravenna, Italy, assignor to Beltrami Osmano, Ravenna, Italy

Filed Dec. 6, 1985, Ser. No. 805,970
Claims priority, application Italy, Dec. 12, 1984, 46314 A/84
Int. Cl.[4] E02F *5/02*
U.S. Cl. 37—103 **7 Claims**



1. A small trolley-mounted home or professional digger, or 'mini-digger' propelled by hand and comprising:

a trolley provided with a handlebar at rear, and at least two wheels or tracks;

at least two height-adjustable front stabilizers;

a least one footboard at rear that can be folded from a first fully-stowed position down to a second fully folded-out operating position in which a wide, firm stance is created in conjunction with the stabilizers independently of the wheels or tracks;

a prime mover and hydraulic power section carried by the trolley;

an earth-moving section consisting of a hinged boom and scoop assembly, mounted to the front central part of the trolley, rotatable about a vertical axis, and comprising a first hydraulic ram raising and lowering a main boom stage, a second hydraulic ram operating a tilt boom stage hinged to the main boom stage, and a third hydraulic ram controlling the scoop, which is hinged to the tilt boom stage, embodied such that the entire boom assembly can be folded away when not in use, into a compact position wherein the main stage and tilt stage are disposed parallel and vertical, almost touching; and

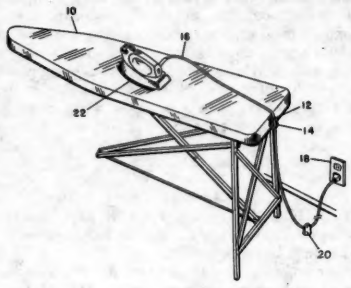
handles mounted to the trolley handlebar which provide for control of digging operations.

4,612,717

RETAINING GUIDE FOR ELECTRIC IRON CORD

Linda F. Alvarez, 20518 Varsity Dr., Walnut, Calif. 91789

Continuation-in-part of Ser. No. 611,033, May 16, 1984, abandoned. This application Jul. 18, 1985, Ser. No. 756,743
Int. Cl.[4] D06F *83/00*
U.S. Cl. 38—104 **18 Claims**



1. A retaining guide for an electric iron cord extending between an electric power outlet and an electric iron atop an ironing board having a top surface and edges, said retaining guide comprising:

a fabric ironing board cover configurated and sized to fit over the top and about the edges of the ironing board,

a ring adapted for sliding extension therethrough of the electric iron cord during movement of the electric iron atop the ironing board, and

means on the cover for attaching the ring to the ironing board cover, said means defining at least one opening on the ironing board cover for extension of the ring therethrough for extension of a relatively taut portion of the electric cord between the ring and the iron in all positions of the iron atop the board.

4,612,718

HOSPITAL IDENTIFICATION BANDS

Samuel G. Golub, Delray Beach, Fla., and Charles E. Garb, Jackson Heights, N.Y., assignors to Graham Field, Inc., New Hyde Park, N.Y.

Continuation-in-part of Ser. No. 470,511, Feb. 28, 1983, abandoned. This application Jan. 18, 1985, Ser. No. 692,920
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—21 C **13 Claims**

1. An identification band, comprising:

a longitudinally elongated base layer formed of a tear-resistant, waterproof, ink-receptive material, said base layer including an eyelet section, an information section and a tongue section, said tongue section extending 30 to 50% of the entire length of said band as measured in the longitudinal direction of said band and being narrower than said eyelet and information sections throughout its entire length, said information section being sufficiently large to permit appropriate identifying material to be imprinted thereon;

a slot formed in said eyelet section, the width of said slot being greater than the width of said tongue section such

that said tongue section can be passed through said slot, said slot extending generally transverse to said longitudinal direction of said band; and

an adhesive layer formed on one surface of said tongue section and over substantially the entire longitudinal length of said tongue section so that when said tongue section is passed through said slot it can be folded back upon itself and two portions of said adhesive layer located on opposite sides of said slot can be placed in contact with each other.

4,612,719

HOLDER FOR ELECTRONIC DETECTION ELEMENT, COMPRISING BAND ATTACHMENT WITH PULL FORCE PROTECTION

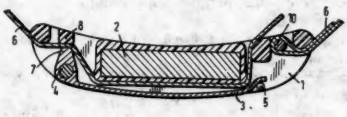
Hendrik J. de Jong, Groenlo, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek NEDAP, De Groenlo, Netherlands

Filed Jul. 27, 1984, Ser. No. 635,123

Claims priority, application Netherlands, Jul. 27, 1983, 8302684

Int. Cl.[4] G09F *3/14*

U.S. Cl. 40—21 R 15 Claims



1. A buckle for receiving an electronic detection element and for attaching a band about the neck or another part of the body of an animal, said buckle comprising:

a holder frame,

a cavity defined by said holder frame for receiving an electronic detection element,

at least one clamping means for adjustably clamping one end of a band on said holder frame, and

shear pin means mounted on said holder frame for attaching another end of said band to said holder frame, said shear pin means fracturing when a predetermined pulling force on the band is exceeded.

4,612,720

LARGE SCALE DISPLAY

John Manners-Smith, Northenden; Christopher G. Thompson, Stapeley, both of England, and John E. Bailey, Rykkinn, Norway, assignors to Ferranti PLC, England

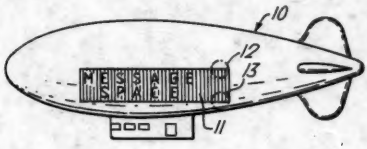
Filed Jul. 18, 1984, Ser. No. 631,877

Claims priority, application United Kingdom, Jul. 26, 1983, 8320169

Int. Cl.[4] G09F *21/16*

U.S. Cl. 40—211 29 Claims

1. A two dimensional display formed on a surface of a structure comprising a set of channels defined on the surface by pairs of shoulders raised with respect to the channels, the channels each extending along one dimension of the display and the set extending along the second dimension, a plurality of one-dimensional display components each comprising a multiconductor electrical cable having elements, each comprising at least one illumination element, attached to appropriate conductors thereof at intervals along its length and located in an individual channel of the set, retaining means comprising for each channel a plurality of retaining members held by said shoulders at a plurality of points along the channel length and extending across the display components operable to retain each of the display means operable to supply energising signals to the display components in accordance with the formation of a desired two-dimensional display of illumination elements.



4,612,721

CONTAINER WITH SOLID PLASTIC LABEL AND METHOD OF APPLYING THE LABEL

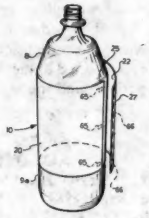
Giancarlo J. Fumei, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1983, Ser. No. 555,787

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

Int. Cl.[4] G09F *3/00*

U.S. Cl. 40—310 16 Claims

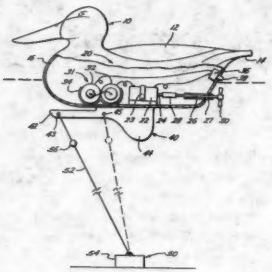


1. A container having a neck and a body, and a plastic label wrapped around the body, the label made of a thermoplastic polymer that is printable and is soluble in a solvent or a solvent polymer system compatible with the label polymer, the label comprising a solid polymer layer having a side that contacts the body and is attached lightly but securely thereto, the foam layer having a leading edge for contacting the body, there being a finite area on the leading edge having a liquid viscous solution of a polymer in a solution in the finite area being adapted to solidify and form a solid bond, the solution forming a momentary tacky bond sufficient to anchor the leading edges to the container body whereby the label can be wrapped around the body, the bond between the label and body becoming weaker as the solidifying solution hardens whereby the label can be easily removed from the container body for recycling without contaminating the material of the container body being reclaimed, the solid layer having a trailing edge that overlaps the leading edge to form a sleeve label with overlapped edges on the container body, and the solid layer of the trailing edge containing a second finite area generally extending along the trailing edge, the second finite area comprising a liquid tacky solution of a polymer in a solvent, the solution solidifying to form a side seam bond on the overlapped edges, the bond becoming stronger whereby, upon use, the side seam resists being pulled apart.

4,612,722
RANDOM MOVEMENT, MOTORIZED WATER FOWL DECOY

Mike C. Ferrell, 11122 Henge Dr., Austin, Tex. 78759

Filed Aug. 31, 1984, Ser. No. 646,695
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 4 Claims

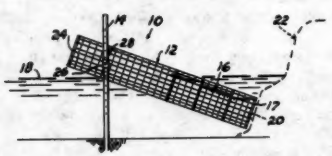


1. A water fowl decoy comprised of a head and a body, said body having a propulsion means located therein for propelling the decoy in the water and said body having a planar bottom with a keel attached thereto, said keel having a rudder portion having a length not exceeding 30% of the overall length of the decoy and the height of the rudder portion being approximately equal to its length, said rudder portion having a convex curvature with respect to the plane of the bottom of the body, said rudder portion being directly below the center of gravity of said head, body, and propulsion means said keel having an attachment section with a tether line and weight attached thereto wherein when the propulsion means is activated the tether line which is connected to the decoy cause said decoy to follow a random path around the weight.

4,612,723
WILD ANIMAL TRAP

Ronald D. Reed, 2120 Shirley La., Choctaw, Okla. 73020

Filed Oct. 4, 1984, Ser. No. 657,560
Int. Cl.[4] A01M *23/18, 23/00*
U.S. Cl. 43—61 3 Claims

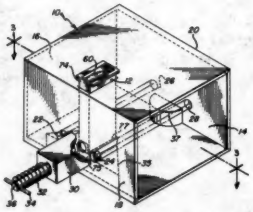


1. A trap for an aquatic fur bearing animal, comprising:
an elongated wall structure defining a passageway having one closed end and its open end adapted to be axially aligned with an animal burrow opening submerged in a body of water;
leg means for supporting the closed end and a portion of the passageway above the water level of the body of water, said leg means comprising a pair of sleeves with each sleeve having a transverse opening and secured in diametric opposition to the outer surface of said wall structure adjacent its closed end, a pair of legs respectively longitudianlly slidably received by each sleeve of said pair of sleeves, each leg of said pair of legs having a series of longitudinally spaced transverse apertures, and, a pin extending through each sleeve and a selected one of the apertures in the respective said leg;
closure means top hinge mounted to the passageway wall adjacent its open end;
resilient means normally biasing the closure means in one direction;
a horizontal trigger rod extending transversely of the passageway;
a trigger swingably mounted transversely of the passageway for vertical movement about the horizontal axis of the trigger rod; and,
trigger setting means for normally holding said closure means and trigger in cocked position.

4,612,724
RODENT CONTROL APPARATUS

Ali H. A. Alboainin, 129 Knapps Hwy., Fairfield, Conn. 06430

Filed Jun. 28, 1985, Ser. No. 750,334
Claims priority, application Egypt, Jul. 8, 1984, 427-1984
Int. Cl.[4] A01M *27/00*
U.S. Cl. 43—73 14 Claims



1. Rodent control apparatus comprising:
an injection chamber;
means for detecting the presence of a rodent in said injection chamber;
means for injecting a spear into a rodent upon detection of the rodent by said detection means;
a slot in said injection chamber; a cartridge containing a plurality of spears for receipt in said slot; and means for aligning said cartridge when passed through said slot with said spear shooting means such that a new spear from the cartridge will be shot each time a rodent is detected by said detection means.

11. A spear in combination with a rodent control apparatus having an injection chamber, means for detecting the presence of a rodent in said injection chamber, and means for injecting said spear into a rodent upon detection thereof, said spear comprising:
a pointed hollow tube;
a blood absorbing material filling said hollow tube; and
a plurality of openings in the wall of said tube to provide a conduit for blood absorbed from outside the tube by the absorbing material.

4,612,725
METHOD FOR ACCLIMATIZING AND PROPAGATING PLANT TISSUE CULTURE SHOOTS

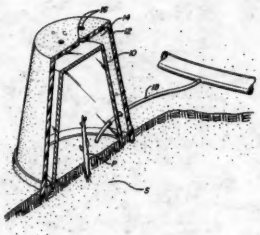
John A. Driver, Modesto, Calif., assignor to Plant Research Laboratories, Modesto, Calif.

Filed Jun. 3, 1985, Ser. No. 740,778
Int. Cl.[4] A01H *3/04;* A01C *1/00*
U.S. Cl. 47—58 28 Claims

1. A method for propagating plant shoots, said method comprising:
multiplying the shoots in a multiplication culture having preselected levels of sugar and available nitrogen to yield a plurality of propagules;
maintaining individual propagules obtained from the multi-

plication culture on a pretreatment medium for a predetermined time period, said pretreatment medium characterized by elevated sugar levels and reduced nitrogen levels relative to those in the multiplication medium;

exposing the propagules to at least one root inducing compound at a concentration sufficient to induce root formation; and



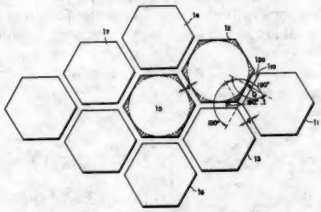
planting the root-induced propagules prior to root emergence directly in a field under a translucent moisture barrier which confers light and humidity conditions selected to allow gradual acclimatization of a resulting plantlet to ambient conditions, whereby initial root formation of the plantlet occurs in the field.

4,612,726

PLANT CULTIVATING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,496
Claims priority, application Japan, Jan. 27, 1984, 59-14113
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 **11 Claims**



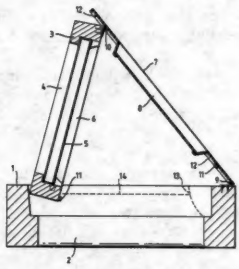
1. Plant cultivating apparatus comprising a plurality of pairs of upright side plates each made of a transparent material, joining means for joining each of said pairs of side plates to form a plurality of upright hexagonal containers, a transparent upper cover mounted on the top of each of said containers to provide an air-tight seal between said cover and the respective container, said upper covers being made of a transparent material, a bottom member means mounted on the bottom of each of said containers to provide an airtight seal between said bottom member means and the respective containers, each of said hexagonal containers having six side walls, said plurality of containers being disposed in spaced array such that a first side wall of a first hexagonal container is disposed in spaced parallel alignment with a first side wall of a second hexagonal container, a second side wall of said first hexagonal container is disposed in spaced parallel alignment with a first side wall of a third hexagonal container, and a second side wall of said second hexagonal container is disposed in spaced parallel alignment with a second side wall of said third hexagonal container to thereby form a space between said first, second and third hexagonal containers having a generally Y-shaped configuration having three leg portions joined at a common center with the angle between each leg portion being 120 degrees, a light source means disposed above said hexagonal containers, said light source means comprising a rotatable shaft, an arm mounted on said rotatable shaft, and at least one light device mounted on said arm for directing light onto said hexagonal containers, said rotatable shaft being disposed upright for rotation about an axis coindicent with said common center of said Y-shaped space such that said shaft can be rotated to dispose said arm and said light device in a plurality of rotatable positions to direct light from said light device onto either one of said first, second and third hexagonal containers, whereby said first, second and third hexagonal containers can be selectively exposed to said light from said light device depending on the rotational position of said shaft to thereby provide for controlled repetition of lighted and non-lighted periods in said containers to thereby enhance the promotion of plant growth in said containers.

4,612,727

WINDOWS

Lars Eriksson, Storgatan 40, S-361 00 Emmaboda, Sweden

Filed May 2, 1984, Ser. No. 606,295
Claims priority, application Sweden, May 27, 1983, 8302994
Int. Cl.[4] E05B *65/04*
U.S. Cl. 49—62 **7 Claims**



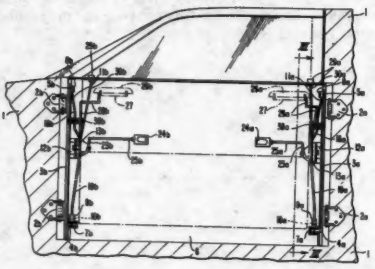
1. A window comprising a frame member; a casement member; an exteriorly disposed structural pivotal member; first pivot means connecting an edge portion of said pivotal member to said frame member; second pivot means connecting an opposite edge portion of said pivotal member to an adjacent edge portion of said casement member; said pivotal member being a protective cladding covering at least an exterior side of said casement member; said protective cladding and said casement member having, at their side edges adjacent said first pivot means, cooperating locking means to selectively lock the cladding and the casement member together to pivot as a rigid unit about said first pivot means and to pivot away from each other about said second pivot means when said protective cladding is pivoted away from said frame member, whereby said casement member may be pivoted to a position where an exterior side thereof is accessible from a location interior of said window.

4,612,728

DOUBLE-OPENING DEVICE OF AUTOMOBILE DOORS

Hattori Moriyoshi, 1658-2, Oaza Takamorimachi, Aso-gun, Kumamoto, Japan

PCT No. PCT/JP82/00301, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03871, PCT Pub. Date Nov. 10, 1983
PCT Filed Aug. 2, 1982, Ser. No. 574,099
Claims priority, application Japan, May 1, 1982, 57-73812
Int. Cl.[4] E05D *15/50*
U.S. Cl. 49—193 3 Claims



1. A door mechanism for making a door openable from the opposite side edges and the opposite sides thereof, comprising:

an automobile door having a frame plate at each side edge thereof having locking projection means thereon extending into said door;

hinge means attached to said frame plates for hinging the opposite sides edges of said door to an automobile body; and

door latching and unlatching means in said door adjacent each side edge, each door latching and unlatching means having:

a locking pawl means adjacent the side edge of said door and engageable with and disengageable from said locking projection means on the frame plate for locking said frame plate to the door or freeing said frame plate from said door;

linkage means connected to said locking pawl means for moving said locking pawl means;

an operating plate rotatably mounted in said door adjacent the side edge of the door and having said linkage means connected thereto for being moved for engaging said locking pawl means with said locking projection means when said plate is rotated in one direction and for being moved for disengaging said locking pawl means from said locking projection means when said plate is rotated in the other direction;

a first door handle means on one face of said door and having a first door handle link means connected with said operating plate and a second door handle means on the other face of said door and having a second door handle link means connected with said operating plate, said door handle link means being connected with said operating plate for rotating said operating plate in said other direction when either of said door handle means is actuated;

spring means connected with said operating plate for urging said operating plate to rotate in said one direction; and

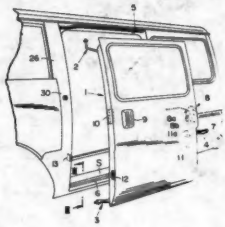
door lock means engageable with and disengageable from said operating plate for blocking said operating plate against rotation or freeing said operating plate for rotation.

4,612,729

SLIDE DOOR OPENING/CLOSING APPARATUS FOR AUTOMOTIVE VEHICLE

Yoshimi Sato, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 30, 1984, Ser. No. 595,539
Claims priority, application Japan, Apr. 14, 1983, 58-66159
Int. Cl.[4] E05F *11/34, 15/00*
U.S. Cl. 49—362 10 Claims



1. A slide door opening and closing apparatus for an automotive vehicle, which comprises:

(a) means for opening and closing a slide door;

(b) a motor for driving said slide door opening and closing means;

(c) an inside door switch means, disposed within a passenger compartment of the vehicle, for rotating said motor in the direction that said slide door opening and closing means opens and closes the slide door; and

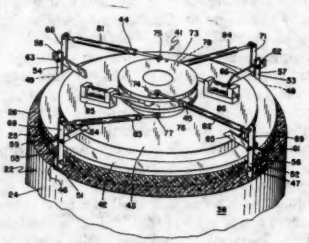
(d) a key-operated lock-type outside door switch means for locking the slide door, disposed in an outside position of the vehicle, and for rotating said motor in a first direction corresponding to the direction that said slide door opening and closing means opens the slide door when said outside door switch is rotated in a first direction and for rotating said motor in a second direction corresponding to the direction that said slide door opening and closing means closes the slide door when said outside door switch is rotated in a second direction.

4,612,730

MECHANICAL CENTERING APPARATUS AND METHOD

William P. Gundy, Amherst, N.H., assignor to NPC Systems, Inc., Milford, N.H.

Filed Aug. 29, 1985, Ser. No. 770,739
Int. Cl.[4] B24B *19/02*
U.S. Cl. 51—3 3 Claims



1. Centering apparatus for centering a base plate of spigot grinding apparatus, as the base plate is being advanced onto the end face of the spigot, for cutting of a sealing groove in, and grinding of a true truncated cone on the outer circumferential face, of the spigot, said apparatus being of the type having two

pairs of diametrically opposed centering guides, each pair oppositely disposed at 180° and each guide of each pair being located at the lower end of one of four guide arms mounted on the rotatable support of said apparatus to pivot in a vertical plane on a horizontal axis, said apparatus characterized by:

each said guide arm having an upper portion extending above said pivot;

upper and lower superposed, pivot plates each mounted to rotate in a horizontal plane on a vertical axis at the center of said rotatable support, each pivot plate having a pair of diametrically opposed studs projecting vertically therefrom;

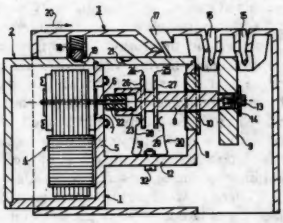
two mechanical links connecting the diametrically opposed upper portions of two of said guide arms to the studs on said upper pivot plate and two mechanical links connecting the diametrically opposed upper portions of the other two guide arms to the studs on said lower pivot plate;

and a pair of diametrically opposed hydraulic cylinder and piston actuators, mounted on said rotating support, each for yieldably resisting turning of said pivot plates and resisting opening of said guide arms while said guides are centering said base plate on said spigot end.

4,612,731
GRINDING MACHINE

Merowech Eckel, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1984, Ser. No. 622,504
Claims priority, application Austria, Jun. 24, 1983, 2328/83
Int. Cl.⁴ B24B *3/36*
U.S. Cl. 51—56 R **4 Claims**

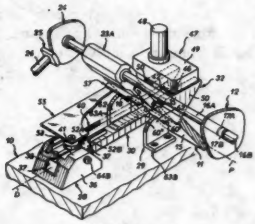


1. Apparatus for sharpening knives, scissors, and similar cutting devices, which comprises a housing forming an enclosure having two oppositely disposed walls each provided with an opening, said openings being coaxially aligned; a motor mounted on the outer side of one of said oppositely disposed walls, said motor having a shaft extending through the opening in said one wall into said enclosure; a second shaft extending through the opening in the other oppositely disposed wall; a grinding wheel fastened to the end of the second shaft positioned outside the enclosure; means for connecting the motor shaft to the other end of the second shaft to rotatably drive said second shaft and to enable axial movement of the motor shaft and the second shaft with respect to each other; a pair of axially spaced radial flanges mounted on the second shaft within the enclosure; a pair of axially spaced strip-shaped leaf springs for cooperation with said radial flanges and attached to the enclosure internally thereof, said radial flanges extend between said pair of leaf springs; and a cover associated with the housing and provided with a guide passage for drawing through a knife into contact with the grinding wheel, said knife when drawn through said guide passage exerting pressure on said grinding wheel and thereby moving the second shaft axially in one direction, whereby one of the radial flanges comes into contact with one of the leaf springs, said one leaf spring, following the drawing of the knife through said guide passage, axially moving the second shaft in an opposite direction.

4,612,732
MACHINE FOR GRINDING OPHTHALMIC LENSES

Luc Delattre, Pont Ste Maxence; Jean-Francois Moulin, Ris Orangis, and Suzan Badin, Savigny-le-Temple, all of France, assignors to Essilor International Cie Generale d'Optique, Creteil, France

Filed May 30, 1985, Ser. No. 739,365
Claims priority, application France, Jun. 4, 1984, 84 08711
Int. Cl.⁴ B24B *9/14*
U.S. Cl. 51—101 LG **19 Claims**

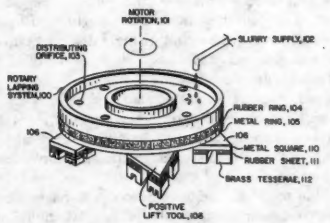


1. Machine for grinding ophthalmic lenses comprising a frame, a grinding tool mounted on said frame for rotation about an axis, a support for attaching an ophthalmic lens to be processed, mounting means mounting said support to said frame for pivoting about a pivot axis parallel to the axis about which said grinding tool is mounted for rotation, a counterweight received on said support and movable relative thereto in a direction orthogonal to said pivot axis, drive means controlling movement of said counterweight on said support, and a fixed guide cam fixed to said frame and arranged on the path of movement of said counterweight, follower means fixed relative to said counterweight for engagement with said guide cam for selectively raising and lowering said support to bring the ophthalmic lens into and out of position relative to said grinding wheel.

4,612,733
VERY HIGH SPEED LAP WITH POSITIVE LIFT EFFECT

Roger K. Lee, Watertown, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 8, 1985, Ser. No. 720,937
Int. Cl.⁴ B24B *7/24*
U.S. Cl. 51—119 **4 Claims**



1. A rotary lapping system capable of grinding and polishing a workpiece using an abrasive slurry liquid, said rotary lapping system avoiding any tendencies to dig into the workpiece by generating a positive lift in its leading edge grinding surfaces causing them to hydroplane above the workpiece through hydrodynamic action with the abrasive slurry liquid, said rotary lapping system comprising:

a supply of the abrasive slurry liquid, which is applied to the workpiece;

a rotary means;

a dish member connected to and being rotated by said rotary means; and

a plurality of positive lift tools, each fixed beneath an outer edge of said dish member and producing said positive lift by presenting leading edge surfaces with a positive angle of attack in said abrasive slurry liquid, said leading edge surfaces generating a positive lift through hydrodynamic interaction with said abrasive slurry liquid, each of said plurality of positive lift tools presenting a grinding surface to said workpiece which, when rotated in said abrasive slurry liquid from said supply, is used to grind said workpiece.

4,612,734

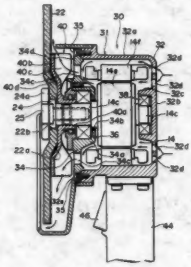
GRINDING MACHINE

Motoharu Nakajima, Toba; Seishiro Sakane, Mie; Norimichi Sato, Shizuoka, and Etsuro Haruta, Shimizu, all of Japan, assignors to Shinko Electric Co., Ltd. and Nippon Kokan Kabushiki Kaisha, both of, Japan

Filed Apr. 23, 1985, Ser. No. 726,065

Int. Cl.[4] B24B *23/02*

U.S. Cl. 51—170 PT **9 Claims**



1. A grinding machine comprising:

(a) a casing comprising a tubular body having an end wall at one end thereof while the other end is open, said end wall having a plurality of intake apertures formed therethrough, said casing comprising a disc-shaped lid secured to said open end of said casing body and having a plurality of discharge apertures;

(b) a motor mounted within said casing body and having a shaft rotatably mounted on said casing for rotation about an axis thereof, said shaft extending generally coaxially with said casing body and projecting outwardly of said lid;

(c) a fan member fixedly mounted on that portion of said shaft extending outwardly of said lid, said fan member comprising a mounting portion of a generally disc-shape disposed adjacent to said lid perpendicularly to said shaft and a plurality of radial blades formed integrally on one face of said mounting portion directed toward said lid;

(d) a grinding wheel mated with and secured at one face to the other face of said mounting portion, whereby upon rotation of said motor, ambient air is drawn by said blades into said casing through said intake apertures and is discharged from said discharge apertures.

4,612,735

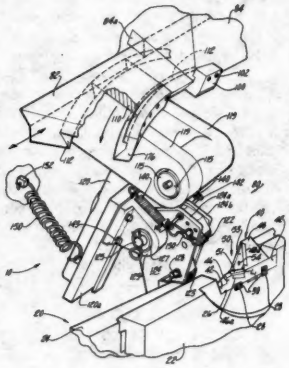
DRILL BIT LUG FIXTURE

Lawrence I. Millay, and Victor F. Dzewaltowski, both of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 9, 1984, Ser. No. 659,146

Int. Cl.[4] B24B *41/06*

U.S. Cl. 51—217 R **12 Claims**



1. A workpart fixture for mounting a workpart on a machine tool wherein the workpart has a body with intersecting body surfaces on a side thereof forming a shaped profile with a selected included angle and wherein the workpart has a projection to be machined extending from the body with said intersecting body surfaces defining a line of intersection offset laterally relative to the projection, comprising a stationary workpart support means having a shaped recess complementary in shape to said shaped profile with intersecting recess surfaces defining an included angle generally the same as said selected included angle to receive said shaped profile of the workpart and with a line of intersection of said recess surfaces offset laterally to correspond to the offset of the line of intersection of said intersecting body surfaces, a slide means moveable laterally relative to workpart in a circular arc path opposite to the direction of lateral offset of the line of intersection of the recess surfaces, clamp means carried on the slide means for movement therewith, means for pivotably mounting the clamp means on the slide means for pivotable movement toward the workpart transverse to the to the slide means for engaging the workpart on another side thereof to exert a clamp force to cause said shaped profile to be clamped in said recess and means carried on the slide means for pivoting said clamp means toward the workpart transverse to the slide means for engaging said clamp means with said another side of the workpart.

4,612,736

METHOD AND APPARATUS FOR BEVELLING OR GROOVING OPHTHALMIC LENSES

Christian Massard, Livry Gargan; Alain Pierre, and Jean-Louis Roumegoux, both of Paris, all of France, assignors to Essilor International Cie Generale d'Optique, Cretell, France

Filed Oct. 16, 1984, Ser. No. 661,314

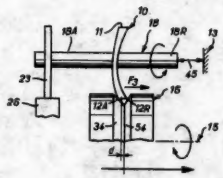
Claims priority, application France, Oct. 18, 1983, 83 16574

Int. Cl.[4] B24B *9/14*

U.S. Cl. 51—284 E **16 Claims**

1. A method for bevelling or grooving a peripheral edge of an ophthalmic lens having an axis, said method comprising the steps of maintaining the peripheral edge of an ophthalmic lens in contact with a bevelling or grooving wheel having an axis while rotating the ophthalmic lens about the axis of the ophthalmic lens, the lens axis extending substantially parallel to the axis of the bevelling or grooving wheel, allowing relative axial displacement between the ophthalmic lens and the bevelling or

grooving wheel thereby producing reaction force generated between the ophthalmic lens and the bevelling or grooving wheel in a zone of mutual contact including an axial component when the peripheral edge of the lens is not aligned with the bevelling or grooving wheel, detecting a physical variable



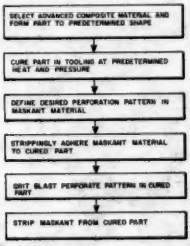
related to the axial component of the reaction forces and adjusting the axial position of the ophthalmic lens relative to the bevelling or grooving wheel in response to the physical variable detected in order to reduce the misalignment of the peripheral edge of the ophthalmic lens relative to the bevelling or grooving wheel.

4,612,737

GRIT BLAST DRILLING OF ADVANCED COMPOSITE PERFORATED SHEET

James M. Adee, San Diego, and John A. Frye, Spring Valley, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jul. 5, 1985, Ser. No. 752,088
Int. Cl.[4] B24C *1/04*
U.S. Cl. 51—310 **10 Claims**



1. A method of forming perforations in contoured resin matrix fiber reinforced advanced composite materials for use in sound attenuation structures for aircraft surfaces, comprising the steps of:

providing a sheet of imperforate contoured resin matrix fiber reinforced advanced composite material for use in sound attenuation structures for aircraft surfaces;

forming a mask having an aperture pattern thereon, the apertures having a diameter in the range of from about 0.010" to about 0.250";

positioning said mask to follow the contour of a surface of said sheet and then releasably adhering said mask to said surface of said sheet;

providing a grit having the capability of blasting through said sheet while retaining said mask on said sheet, said grit having a particle grit number range of from about 60 to about 240 grit;

blasting said grit against said mask at a pressure in the range of from about 70 to 100 pounds per square inch at an angle of from 0 degrees to about 8 degrees relative to the walls of the apertures in said mask to form apertures in said sheet at the locations of said apertures; and

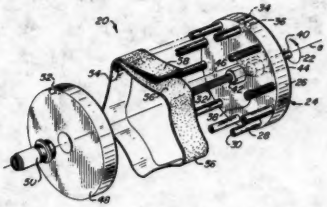
removing said mask.

4,612,738

ROTARY FLAIL CUTTING AND FINISHING TOOL HEAD

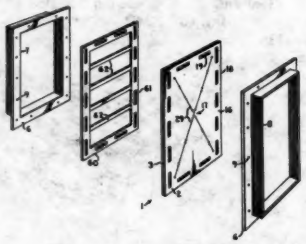
Charles B. Pittinger, Sr., and Cynthia A. Pittinger, both of 902 N. Lake Dr., Weatherford, Tex. 76086

Filed Jul. 2, 1985, Ser. No. 751,050
Int. Cl.[4] B24B *9/02*
U.S. Cl. 51—335 **2 Claims**



symmetrically disposed about said center and located on said axis;

(2) said body having a plurality of slits extending between near said peripheral margin to near said center and being closely spaced from said first and second apertures; each of said slits being located near diagonals of



said body and having bores positioned on each end thereof; and

(b) a sealing membrane bonded to said rupture body; said sealing membrane being bonded to said rupture body on near both sides of each of said slits; said sealing membrane being of a semi-elastic material and substantially resistant to expansion in the area of said slits.

4,612,740

FALL PREVENTION MEANS FOR FURNITURE

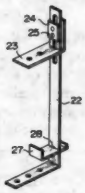
Shigekazu Yamamoto, 20-11, Nishiogu 3-chome, Arakawa-ku, Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,989

Claims priority, application Japan, Sep. 9, 1982, 57-136790[U]; Dec. 28, 1982, 57-201406[U]

Int. Cl.⁴ A47B *5/00*

U.S. Cl. 52—36 **5 Claims**



1. A fall prevention means for furniture comprising:

(a) a location member fixed to the surface of a room against which surface the furniture is to be located, said location member having a vertical portion spaced from said wall,

(b) an engagement member fixed to the furniture and adapted to be slidable along the vertical portion of said location member, and

(c) adjustable connecting means to detachably connect said location member and said engagement member when said furniture is solidly supported with respect to said room surface, said adjustable connecting means including a slot in said engagement member so that said location member may slide in said slot and be securely affixed at a predetermined location.

4,612,741

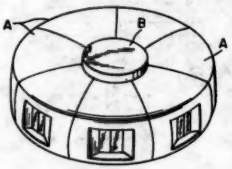
RADIALLY SEGMENTED PLASTIC BUILDING

Clayton J. Jacobson, Box 5338, ELRB, Parker, Ariz. 85344

Filed Oct. 20, 1982, Ser. No. 435,470

Int. Cl.⁴ E04H *1/00*

U.S. Cl. 52—79.4 **4 Claims**



1. A basically round single unit building structure wherein the major structural component is foam, the generally flat floor portion, single vertical exterior wall and upwardly inwardly sloping roof portion are internally structured of foam, comprised of radially disposed wedge shaped sections which are tensioned toward the center and compressed laterally forming a structure of such integral strength that no foundation is required.

4,612,742

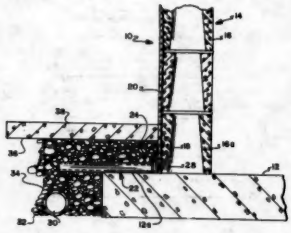
WALL AND FOUNDATION DRAINAGE CONSTRUCTION

Joseph Bevilacqua, 903 Bevan St., Akron, Ohio 44319

Continuation of Ser. No. 245,269, Mar. 19, 1981, abandoned. This application Sep. 23, 1983, Ser. No. 535,157

Int. Cl.⁴ E04B *1/64*

U.S. Cl. 52—169.5 **3 Claims**



1. A foundation wall construction comprising a footer, a drain tile extending along adjacent one margin of said footer,

a wall on said footer and formed of hollow building blocks having openings in their upper and lower surfaces arranged vertically on said footer, the lowermost row of said building blocks having enlarged openings in the inner surfaces thereof that connect with the interiors of said hollow building blocks and form drainage openings adjacent and above said drain tile, said foundation wall forming part of a basement and said wall having inner and outer surfaces,

a drain device comprising a covered member having a plurality of longitudinally enclosed drain slots formed in its lower surface positioned on a top portion of said footer and extending therebeyond substantially to said drain tile, said drain device having an end abutted against said inner surface of said blocks whereby the drain slots are in liquid flow communicable with the enlarged openings in the building blocks, said drain slots extending substantially perpendicular to the building blocks and the length of said drain device,

a gravel fill over said drain tile and drain device and extending to said blocks, and

a cement floor pad on said gravel fill.

4,612,743

FRAME CONSTRUCTION AND PROFILE SECTIONS FORMING SAME

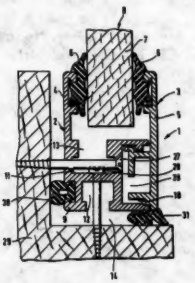
Heinrich Sälzer, Industriestrasse 4, 3550 Marburg, Wehrda, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,800

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419413

Int. Cl.[4] E06B *3/05, 3/26*

U.S. Cl. 52—208 5 Claims



1. A frame of frame legs for the formation of rectangular receptacles for the edge portions of panels such as windows, doors and the like each said leg comprising a pair of profiled parts adapted to be assembled to form a generally U-shaped section arranged to encompass an edge portion of a said panel, characterized in that one of said profiled parts includes a longitudinally extending first chamber opening in the direction of said edge portion of said panel, said one of said parts including in addition a second chamber opening in a direction facing away from said edge portion of said panel, a corner angle having elements disposed in said first chambers of adjacent frame legs, a threaded member disposed in said second chamber of said one profiled part of at least one of said legs, fastening means disposed in generally coplanar alignment with said panel in a direction away from said panel and securing said corner angle in said first chamber of said adjacent legs, mounting means disposed adjacent an edge portion of said frame in covering relation of said opening of said second chamber, and second fastening means in generally coplanar alignment with said panel extending through said mounting means and said opening of said second chamber into locking engagement with said threaded member, said second fastening means being directed toward said panel.

4,612,744

METHOD, COMPONENTS, AND SYSTEM FOR ASSEMBLING BUILDINGS

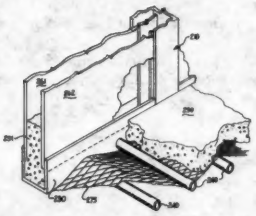
Jack E. Shamash, 1172 Park Ave., New York, N.Y. 10028

Continuation-in-part of Ser. No. 290,855, Aug. 7, 1981, abandoned. This application Apr. 27, 1984, Ser. No. 604,819

Int. Cl.[4] E04B *5/48;* E04F *17/06*

U.S. Cl. 52—220 16 Claims

1. An elongate thermoplastic structural member for use in building construction including side flanges spaced laterally apart, extending longitudinally of the member, a connecting web portion extending longitudinally of the member between said flanges and integral with the flanges, a further pair of flanges integral with the connecting web portion, laterally interior of the side flanges and extending longitudinally of the structural member proximate the side flanges and the side flanges defining slots for receiving edges of panels forming opposite surfaces of a building wall, the further flanges having a height measured from the connecting web portion less than the height of the side flanges so measured, the elongate edges of the further flanges and interiorly facing surfaces of the side flanges between the location of said further flange edges and of the side flanges defining means for receiving a closure member located between the side flanges at the longitudinal ends of the



further flanges to close the interior of the structural member; at at least one end of the structural member, said pair of further flanges terminate short of the ends of the side flanges, the ends of the pair or further flanges and interiorly facing surfaces of the side flanges defining means for receiving a portion of a spanning element extending from the structural member to a like structural member.

4,612,745

BOARD FLOORS

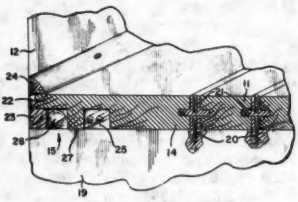
Oskar Hovde, Kyvannsveien 34, N-7000 Trondheim, Norway

Continuation of Ser. No. 498,970, May 27, 1983, abandoned. This application Sep. 4, 1985, Ser. No. 773,096

Claims priority, application Norway, Aug. 9, 1982, 822,703

Int. Cl.[4] E04F *15/14;* E04B *5/48*

U.S. Cl. 52—220 8 Claims



1. A floor board adapted for fitting between a wall and a main portion of a board floor, said board being formed at its one side with a longitudinal groove for interconnectingly receiving a projecting part of said main floor portion and at its opposite side with an undercut for running alongside said wall while extending laterally inwards over a substantial portion of the breadth of said board.

4,612,746

TRENCH DUCT AND COVER ASSEMBLY

Robert G. Higgins, 1112 W. North Ave., Apt. 4, Pittsburgh, Pa. 15212, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 22, 1985, Ser. No. 693,463

Int. Cl.[4] E04F *17/08;* E04B *5/48*

U.S. Cl. 52—221 21 Claims

1. A trench duct assembly comprising:

an elongated duct body having a bottom wall with first and second side walls extending generally normally outward therefrom in laterally spaced opposed relation for defining a generally U-shaped body cross-section;

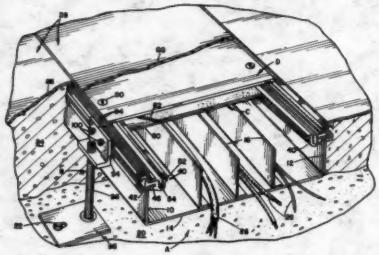
a rail associated with said body at a distal end of said first

side wall including a generally L-shaped channel receiver portion disposed adjacent to and axially of said distal end;

a generally L-shaped channel member closely disposed in said channel receiver portion with said channel member having first and second legs of predetermined widths joined at a vertex zone, said channel member further including a receiving groove extending axially along said vertex zone;

a seal member closely confined in said receiving groove; and,

a cover member having a predetermined thickness in cooperative association with said channel member, one leg of



said channel member being closely disposed to a side edge of said cover member and the other leg of said channel member being disposed in supporting relation to said cover member with said seal member sealingly engaging said cover member at generally a corner area thereof, the width dimensions of said channel member legs being such that an outer terminal end of said one leg is generally flush with an outer surface of said cover member in a first orientation of said channel member and said one leg end extends outwardly from said cover member outer surface by some predetermined distance in a second orientation of said channel member.

4,612,747

CONNECTION OF A CAST-IN-PLACE REINFORCED CONCRETE SLAB TO A PREFABRICATED COLUMN

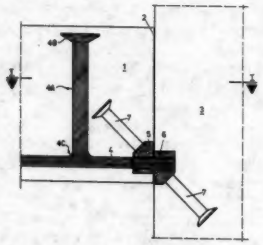
Wolfhart Andrä, Stuttgart; Wilhelm Zellner, Leinfelden-Echterdingen; Willi Kunzl; Horst Falkner, both of Böblingen; Bernhard Göhler, Renningen, and Hans-Peter Andrä, Stuttgart, all of Fed. Rep. of Germany, assignors to Deha Baubedarf GmbH & Co. KG, Gross-Gerau, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,837

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417330

Int. Cl.[4] E04B *1/00*

U.S. Cl. 52—250 **13 Claims**



1. In an assembly of a cast-in-place concrete slab of reinforced concrete or prestressed concrete to a column passing vertically through the slab, said slab facing said column along a substantially planar vertical interface, steel inserts embedded in said slab at said interface, each insert including a first generally horizontal recess facing said interface in alignment with a second generally horizontal recess in said column, a plurality of generally horizontal steel reinforcing bars embedded in said slab, a plurality of generally vertical reinforcing studs embedded in said slab and including lower ends connected to said bars, said bars spaced apart horizontally in a fan-like pattern converging toward said column, said bars passing through and beyond said first recess and into said second recess, said first and second recesses shaped correspondingly to the cross-sectional shape of said bars and tightly embracing said bars.

4,612,748

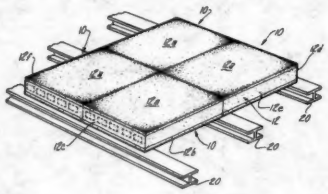
POLYMER CONCRETE BLOCK

Ronald G. Arnold, 43842 12½ Mile Rd., Novi, Mich. 48050, and Edmund J. Matras, 7342 Oakman Blvd., Dearborn, Mich. 48126

Filed Jan. 14, 1985, Ser. No. 690,892

Int. Cl.[4] E04C *1/00*; E04B *5/10*

U.S. Cl. 52—309.16 **9 Claims**



1. A block especially suited for use an an unsupported floor slab, said block comprising:

(A) a monolithic rectangular parallelipipid matrix formed of polymer concrete and having parallel, flat upper and lower surfaces, end edge surfaces, and side edge surfaces;

(B) a row of steel tubes embedded in said polymer matrix with

(1) said polymer concrete totally filling said tubes,

(2) said tubes extending in side by side spaced parallel fashion substantially from end to end of said matrix and generally parallel to said side edge surfaces of said matrix,

(3) said row of tubes extending substantially totally across said matrix from a location adjacent one side edge surface to a location adjacent the other side edge surface,

(4) the upper surface of said tubes spaced below said upper surface of said matrix, and

(5) the lower surface of said tubes spaced above said lower surface of said matrix;

(C) a first sheet of fabric embedded in said matrix between, and spaced respectively from, the upper surfaces of said tubes and said upper surface of said matrix; and

(D) a second sheet of fabric embedded in said matrix between, and spaced respectively from, the lower surfaces of said tubes and said lower surface of said matrix.

4,612,749

SET OF CONSTRUCTION ELEMENTS

Guidalberto Beltrame, 1964 Plan Conthey, Switzerland

Filed Jul. 18, 1985, Ser. No. 756,451

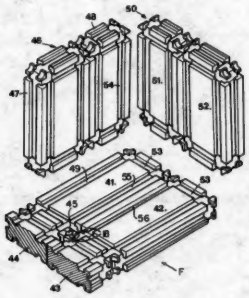
Claims priority, application Switzerland, Jun. 6, 1985, 2394/85

Int. Cl.[4] E04B *1/02*

U.S. Cl. 52—561 **8 Claims**

1. Set of construction elements making it possible to constitute several walls assembled together, this set comprising plane rectangular panels, each panel having two main faces each provided with a groove extending adjacent and parallel to each of four edges on said face, four edge faces on said panel each having a groove oriented in the direction of the length of each of the edge faces, these latter grooves being half-way

between said edges of the main faces of the panel, hooking elements having projections intended to be introduced in selected ones of said grooves of two contiguous ones of said panels to assemble them together, characterized in that each said groove parallel to an edge of a face of a panel is connected



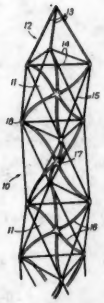
to the corresponding groove located on the other face by two grooves going through two said edge faces and the ends of two adjacent ones of said edge faces are connected together by reverse quarter-round cylindrical surfaces, to form a circular cylindrical free passage between four of said panels juxtaposed in the same plane.

4,612,750

PRE-STRESSED TRUSS-LIKE BEAM WITH ELEMENTS IN BUCKLED STATE

Michel Maistre, Bordeaux, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Feb. 20, 1985, Ser. No. 703,517
Claims priority, application France, Feb. 20, 1984, 84 02525
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—638 **10 Claims**



1. Truss-like beam formed by the regular repetition along the axis of the beam, of polyhedral elementary cells, each cell having two parallel and identical end faces, shaped as regular polygons with n sides which constitute the faces shared with the adjacent cells, wherein, when the beam is in operating condition:

each end face is rotated with respect to the other relative to the axis of the beam,

each cell is defined laterally by 2n triangular faces formed by joining each apex of one end face to the two closest apices of the opposite end face,

the elementary edges of the cell are formed by elements which are permanently undergoing tensile stresses, and

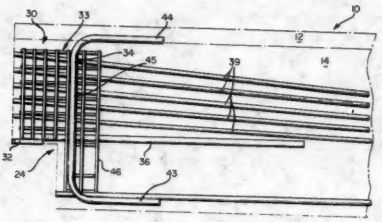
rigid bars in buckled condition due to induced axial loading connect the apices of every elementary cell to its center.

4,612,751

DAPPED END REINFORCEMENT ASSEMBLY FOR PRECAST PRESTRESSED CONCRETE MEMBERS

Edward C. Gloppen, Elk Grove Village, and Norman L. Scott, Glenview, both of Ill., assignors to Dur-O-Wal, Inc., Arlington Heights, Ill.

Filed Jul. 9, 1985, Ser. No. 753,159
Int. Cl.[4] E04C *3/20*
U.S. Cl. 52—723 **3 Claims**



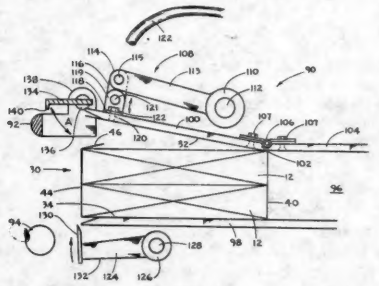
1. A reinforcing structure for a concrete dap beam end, the structure comprising a horizontally disposed bearing plate located at a dap bearing surface, a vertically oriented planar reinforcing means comprising an open mesh of interconnected rod members of relatively small cross-sectional dimensions, the reinforcing mesh extending above and inboard of the dap formation, a vertical reaction bar means connected to the vertically oriented reinforcing means and having a vertically oriented mediate portion of relatively large cross-sectional dimensions situated on one side of the vertically oriented planar reinforcing means, and horizontally oriented reaction bar end portions extending horizontally from the mediate portion across the width of the vertically oriented planar reinforcing means to points on the opposite sides of the vertically oriented planar reinforcing means, and longitudinally disposed reinforcing bar means of relatively large cross-sectional dimensions oriented parallel to but spaced horizontally apart from said vertically oriented planar reinforcing means.

4,612,752

CARTON FLAP FOLDING ASSEMBLY FOR CIGARETTE CARTONS

Philip A. Deal, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 30, 1985, Ser. No. 782,087
Int. Cl.[4] B65B *7/26*
U.S. Cl. 53—377 **12 Claims**



1. A carton flap folding assembly for use with single, tuck flap cigarette cartons, said carton flap folding assembly comprising:

spaced upper and lower plates defining a cigarette carton receiving recess, a portion of said upper plate being hinged for movement with respect to said lower plate;

means to raise and lower said upper hinged plate;

means to releasably secure to said upper hinged plate a major face of a carton positioned in said carton receiving recess while said hinged plate is being raised to raise said major carton face;

lower tucking means to raise a single tuck flap portion of said carton; and

upper tucking means to tuck a flap edge of said single tuck flap beneath said the raised major face of said carton to close said carton.

4,612,753

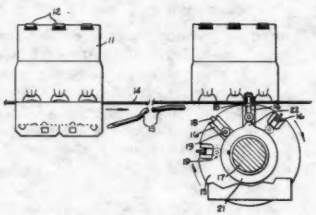
METHOD AND APPARATUS FOR LOCKING A CARRIER

Bobby C. Taylor, Eros, and Peter C. Olsen, Jr., West Monroe, both of La., assignors to Manville Service Corporation, Denver, Colo.

Filed Jun. 6, 1985, Ser. No. 741,983

Int. Cl.[4] B65B *21/24*

U.S. Cl. 53—398 **9 Claims**



6. A method for locking a wrap-around carrier about one or more articles, said carrier including on the bottom wall thereof a locking mechanism having a tab and an opening, said tab having at least one dimension greater than the corresponding dimension of the opening, said method comprising the steps of:

transporting said article along a predetermined path; surrounding said article with said carrier such that said tab is adjacent said opening and both said tab and said opening are adjacent the bottom of the article;

directing a finger adapted for reciprocal motion into contact with said tab;

moving the finger upwardly against said tab and deforming said tab;

moving the finger further upwardly and forcing said tab through said opening; and

retracting said finger from contact with said tab.

4,612,754

METHOD OF INSERTING A SLIDE INTO A FRAME

Arnold Neuhold, Farchant, and Claus Pohl, Eschenlohe, both of Fed. Rep. of Germany, assignors to Geimuplast Peter Mundt GmbH & Co. KG, Farchant, Fed. Rep. of Germany

Filed Apr. 9, 1985, Ser. No. 721,465

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3414021

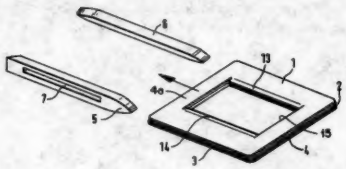
Int. Cl.[4] B65B *61/20, 63/00*

U.S. Cl. 53—457 **7 Claims**

1. A method of inserting a slide into a slide frame of elastic plastic material, said method comprising the following steps:

(a) providing a generally rectangular slide frame that includes a pair of slots extending along each of a pair of opposed edges, the frame having a picture opening that includes antipopping ribs along at least two opposed edges of the opening for cooperatively engaging a slide between the ribs and internal surfaces of the frame;

(b) inserting wedges into each of the slots to enlarge the slots and to space the antipopping ribs from the internal surfaces of the frame;



(c) inserting a slide laterally into one of the enlarged slots to position the slide relative to the picture opening in the frame; and

(d) removing the wedges from the slide frame.

4,612,755

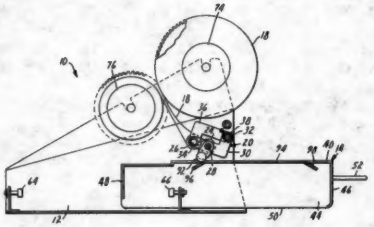
BLISTER PACK LAMINATING DEVICE AND METHOD

Michael J. Cavanagh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 24, 1985, Ser. No. 758,530

Int. Cl.[4] B65B *7/16*

U.S. Cl. 53—485 **20 Claims**



1. A device for laminating a barrier film to a blister pack comprising:

a housing;

a two-cycle carriage assembly attached to said housing for reciprocatory, linear movement into said housing during one cycle and out of said housing during one cycle;

tray means for holding a blister pack on said carriage assembly;

barrier film applicator means attached to said housing and including a pair of rollers for laminating a barrier film to said blister pack during either of said cycles;

drive means associated with said barrier film applicator means for rotating said pair of rollers;

holding means associated with said pair of rollers for holding said barrier film between said pair of rollers;

prevention means associated with said barrier film applicator means for preventin said barrier film from coming in contact with and being applied to said blister pack during one of said cycles; and

advancing means associated with said barrier film applicator means for advancing said barrier film during said other cycle toward and in contact with said blister pack to apply said barrier film to said blister pack.

12. Method for laminating a barrier film to a blister pack comprising the following steps:

placing a blister pack on a two-cycle carriage assembly;

reciprocating said carriage assembly along its linear axis into a housing during one cycle and out of said housing during one cycle; and

preventing a barrier film from contact with said blister pack

during one cycle, and contacting said barrier film to said blister pack during said other cycle to apply said film to said blister pack.

4,612,756
APPARATUS FOR INTRODUCING CIGARETTE GROUPS INTO CIGARETTE PACKS

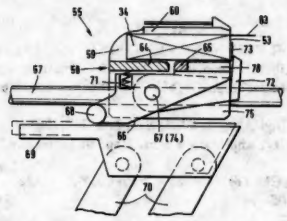
Heinz Focke, and Horst Langer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,617

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150447

Int. Cl.⁴ B65B *47/00*

U.S. Cl. 53—579 **24 Claims**



1. In an apparatus for filling hinged boxes formed from a foldable blank (20), said apparatus including a number of box pockets (36) each for maintaining an at least partially formed hinged box adapted to receive box contents at least partially wrapped in a wrapping blank to form a block (34) of the box contents prior to insertion into the box, the improvement comprising block pocket means (55) for carrying said block (34) from a conveying means (54) to a box pocket comprising:

a top wall (60), side walls (59), and a bottom (58);

said bottom (58) being comprised of a first fixed portion (64) and a second, movable portion (65) movable in a direction toward said top wall (60) to force a block therein against the top wall (60).

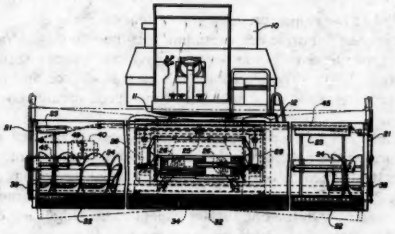
4,612,757
COMBINE HEADER ATTITUDE CONTROL MECHANISM

Lawrence M. Halls, New Holland, and Edward J. Wynn, Leola, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 12, 1985, Ser. No. 722,952

Int. Cl.⁴ A01D *67/00*

U.S. Cl. 56—10.2 **17 Claims**



1. In a combine harvester having a mobile frame adapted for movement over a field, crop harvesting means supported by said frame to harvest crop material delivered thereto; crop feeding means operatively associated with said crop harvesting means to deliver crop material thereto; a transversely extending crop gathering header operatively connected to said crop feeding means to gather crop material from said field and convey said crop material to said crop feeding means, said header having first and second tranversely spaced sidewalls and a longitudinally extending center line substantially equidistantly between said sidesheets and being supported from said frame for transverse tilting movement relative to said frame to permit said header to follow transversely changing ground contours and for vertical movement relative to said frame to permit said header to follow longitudinal elevational changes in ground contours; header lift means operatively associated with said header to power said vertical movement; header tilt means operatively associated with said header to power said transverse tilting movement; sensor means supported by said header to sense changes in the ground contours; and control means operatively interconnecting said sensor means and said header lift means and said header tilt means for actuation thereof to permit said header to follow changing ground contours in response to the sensing of said changing ground contours by said sensor means, an improved sensor means comprising:

a first sensor bar substantially extending between said first header sidewall and said centerline and being rotatably mounted for rotational movement in first and second opposing directions in response to changes in ground contour between said first sidewall and said centerline;

a second sensor bar substantially extending between said second sidewall and said centerline and being rotatably mounted for rotational movement in first and second opposing directions in response to changes in ground contour between said second sidewall and said centerline independently of said first sensor bar; and

each said sensor bar having a plurality of fingers projecting therefrom to follow the highest contour of the ground beneath the respective said sensor bar and effect rotation thereof, said control means being operatively connected to said first and second sensor bars to effect operation of said header lift means when said first and second sensor bars are rotated in like directions and to effect operation of said header tilt means when said first and second sensor bars are rotated in opposite directions and when only one of said sensor bars is rotated.

4,612,758
CUTTING FINGER FOR FINGER-BAR CUTTERS

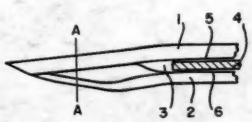
Gustav Schumacher, II, Gartenstrasse 8, and Günter Schumacher, Raiffeisenstrasse 10, both of 5231 Eichelhardt, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 521,670

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230882

Int. Cl.⁴ A01D *55/10*

U.S. Cl. 56—310 **10 Claims**



1. A cutting finger for finger-bar cutters of harvesting machines, said cutting finger comprising a finger top part and a finger bottom part formed from flat material and defining a blade gap there-between, said finger top and bottom parts being connected to one another by welding in a finger front portion located in front of the blade gap, at least one of the finger top and bottom parts being bent or deformed in said finger front portion located in front of the blade gap, characterized in that at least one of the finger top part and the finger bottom part are deformed in the form of a twisting around the longitudinal axis of the cutting finger and are connected in the twisted area by welding.

4,612,759
METHOD OF AND DEVICE FOR PROVIDING A CONCENTRIC LAYER OF WIRE MATERIAL ON A CABLE

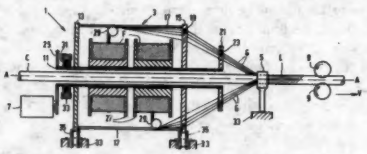
Johan F. R. Meijer, Zaandam, Netherlands, assignor to N.K.F. Groep B.V., Rijswijk, Netherlands

Filed Jun. 12, 1985, Ser. No. 744,164

Claims priority, application Netherlands, Jun. 15, 1984, 8401894

Int. Cl.⁴ H01B *13/26, 13/08*

U.S. Cl. 57—17 **4 Claims**



1. A method of providing a concentric layer of wire material on a cable, in which several wires are taken off feed reel means and are wrapped with a given pitch around the cable as it is moved along a rectilinear transport path, said method including taking a plurality of wires simultaneously off at least one common rotating feed reel in a tangential direction, said feed reel being disposed coaxially with the transport path of the cable, said plurality of wires being wound parallel to and beside each other on said feed reel, said wires being directed from the tangential direction into the direction of said transport path, said wires being spread in the circumferential direction at given pitch distances by guiding each of said wires to a different point located at the same predetermined circumference from said transport path, said points all lying in the same plane perpendicular to said transport path, and wrapping said wires around said cable with the same relative pitch distance.

4,612,760
DRIVE FOR MULTIPLE-SPINDLE TWISTING OR SPINNING MACHINE

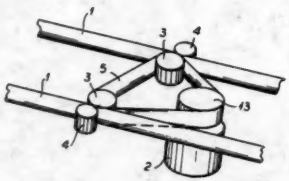
Horst Wolf, Albershausen, and Friedrich Dinkelmann, Rechberghausen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Dec. 23, 1985, Ser. No. 812,253

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1985, 3500322

Int. Cl.⁴ D01H *1/241;* F16H *7/02*

U.S. Cl. 57—105 **14 Claims**



1. In combination with a spinning or twisting machine having a plurality of spindles rotatable about upright axes aligned in a row and each provided with a whorl tangentially engaged by the outer face of a straight stretch of a flat drive belt, a drive system comprising:

a motor having an output pulley rotatable about an upright axis adjacent the flat drive belt;

a drive wheel operatively tangentially engaging one face of the flat drive belt at a drive location;

another belt reeved over the output pulley and drive wheel and driving the latter from the former;

a pinch roller operatively engageable with the other face of the flat belt at the drive location; and

biasing means for pressing the pinch roller against the other face of the belt at the location and thereby pinching the flat belt between the pinch roller and the drive wheel.

4,612,761
DRIVE FOR SPINNING OR TWISTING MACHINE

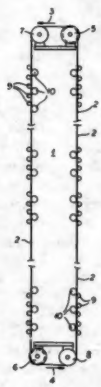
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,156

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434311

Int. Cl.⁴ D01H *1/241;* F16H *7/02, 55/32*

U.S. Cl. 57—105 **11 Claims**



1. A drive system for a plurality of whorls rotatable about respective whorl axes and having radially outwardly directed faces centered on the respective axes, forming a discontinuous whorl surface, and of a predetermined whorl width measured parallel to the respective axes, the system comprising:

an endless flat drive belt extending past the whorls generally perpendicular to their axes and having a first belt surface radially directly confronting the whorl surface and of a predetermined axial belt width measured parallel to the axes;

pusher rollers bearing radially inward against the belt and urging the belt surface toward the whorl surface; and

a ridge formed on one of the surfaces, radially engaging the other surface, holding the rest of the other surface out of contact with the one surface except at the ridge, and of a predetermined width measured parallel to the axes equal to at most one-third of the belt width, said belt having an opposite second belt face and the pusher rollers having roller faces radially engageable with the other belt surface, centered on respective roller rotation axes, forming a discontinuous roller surface, and being of a predetermined effective roller width measured parallel to the respective axes and equal to at most one-third of the belt width.

4,612,762

CLEANING ARRANGEMENT FOR OPEN-END FRICTION SPINNING MACHINES

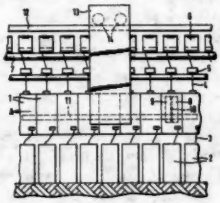
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,557

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339129

Int. Cl.[4] D01H *7/885, 1/135*

U.S. Cl. 57—301 **13 Claims**



1. A method of cleaning a spinning unit of an open-end friction spinning machine of the type having spinning units which contain a pair of adjacently arranged friction rollers forming a wedge-shaped yarn forming gap therebetween, roller driving means for driving the rollers in the same rotational direction, and holding force means for applying holding forces to hold the forming yarn and supplied fibers in the wedge-shaped gap during normal spinning operations, said method comprising:

reducing the effect of the holding means at the wedge-shaped gap, and activating cleaning means to clean the area of the wedge-shaped gap while the effect of the holding force means is reduced, said holding force means including roller friction surface means and at least one suction device means, said reducing the effect of the holding force means including temporarily driving the roller which normally rotates into the wedge-shaped gap during a spinning operation so as to rotate in the opposite rotational direction.

4,612,763

PRESSURIZED AIR CLEANING ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Aug. 27, 1985, Ser. No. 769,716

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432622

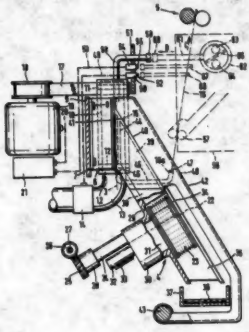
Int. Cl.[4] D01H *7/885, 15/00*

U.S. Cl. 57—301 **29 Claims**

1. Apparatus for open-end friction spinning having at least one spinning unit including drivable friction surface means defining a yarn formation zone and suction channel means disposed adjacent said yarn formation zone for drawing in a yarn end to be pieced during a piecing operation, comprising:

first air stream means for applying a suction force on said yarn end,

second air stream means for creating a cleaning air stream in the region of the yarn formation zone, and



control means for selectively connecting said suction channel means with said first and second air stream means.

4,612,764

CONDITIONING ARRANGEMENT FOR OPEN-END FRICTION SPINNING MACHINE

Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, and Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, both of Fed. Rep. of Germany, assignors to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

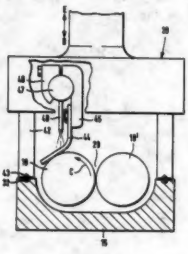
Filed Oct. 4, 1984, Ser. No. 657,514

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336591

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] D01H *7/885, 1/20*

U.S. Cl. 57—401 **38 Claims**



1. Open end friction spinning apparatus including at least one spinning unit comprising:

adjacently arranged first and second friction rollers driven in the same rotational direction and forming a wedge-shaped yarn forming gap therebetween,

and friction roller conditioning means for conditioning the friction surfaces of at least one of the friction rollers.

4,612,765

ANVIL APPARATUS FOR A PRESS

Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jun. 27, 1985, Ser. No. 749,331

Int. Cl.[4] B21L *9/06*

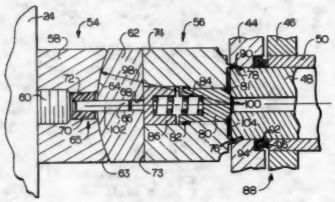
U.S. Cl. 59—7 **2 Claims**

2. A self-aligning anvil assembly for use in a press to drive a

work-engaging surface of a tool against a workpiece, comprising:

an adapter member for mounting to the press at one end and having a concave semi-spherical surface at its opposite end;

an anvil member having a work-engaging surface for engaging the workpiece and a complementary semi-spherical surface mating with and engaging the concave semi-spherical surface;



a resilient member mounted in a bore in one of the members at its center;

a pin secured to the other member at its center and extending across the semi-spherical mating surface and into the resilient member; and

wherein the semi-spherical mating surfaces each have a radius extending from an intersection of a centerline of the anvil assembly and a plane defined by the work-engaging surface of the tool.

4,612,766

APPARATUS FOR COMPENSATING FOR VARIATIONS IN PRESSURE AND FLOW IN FUEL SUPPLY SYSTEMS OF GAS TURBINE ENGINES

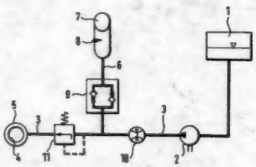
Wolf-Dieter Eder, Dachau, Fed. Rep. of Germany, assignor to MTU, Munich, Fed. Rep. of Germany

Filed Jan. 15, 1985, Ser. No. 691,547

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401397

Int. Cl.⁴ F02K *3/10*

U.S. Cl. 60—261 **11 Claims**



1. Apparatus for compensating for variations in pressure and flow in fuel supply systems of gas-turbine and jet engines, comprising a pump feed means for feeding liquid under pressure in a supply line, an accumulator feed means connectible to said supply line depending upon operating conditions to supplement liquid feed or to receive liquid, and accumulator disconnection valve means connected to said accumulator feed means and to said supply line for selectively and automatically connecting the accumulator feed means and the supply line in response to pressure difference therebetween while relieving the accumulator feed means from existing variations in pressure in the liquid feed, said valve means comprising first and second, opposed valve members supported for independent relative movement, first and second spring members respectively acting on said first and second valve members to urge the same into engagement with one another, said first and second valve members being displaceable in response to pressure difference between the accumulator feed means and said supply line, said valve members having a first position engaged with one another for blocking communication between said accumulator feed means and said supply line, a second position in which both valve members remain engaged with one another but are displaced together to permit flow from the accumulator feed means to said supply line and a third position in which one valve member is displaced with respect to the other valve member to permit flow from said supply line to said accumulator feed means, a housing in which said valve members are displaceable, said first valve member including a stem guidably supported in said housing and an extension slidably supporting said second valve member, said first valve member comprising a valve seat plate having opening means through which liquid can flow, a collar in said housing, said valve seat plate being urged by said first spring member towards said collar and being in sealing contact with said collar in said first and third positions, said second valve member including a pressure plate urged by said second spring member towards said valve seat plate and being engaged with said valve seat plate of said first valve member to block said opening means in said first and second positions and to be displaced from said valve seat plate against the opposition of said second spring member in said third position.

4,612,767

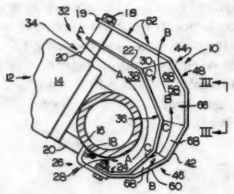
EXHAUST MANIFOLD SHIELD

Karl R. Engquist, Peoria, and Keith K. Klintworth, Dunlap, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 1, 1985, Ser. No. 707,301

Int. Cl.⁴ F01N *7/10*

U.S. Cl. 60—321 **15 Claims**



1. A heat shield assembly adapted for use with an exhaust system of an engine, comprising:

a heat source connected to the engine;

an inner member partially surrounding the heat source and being supported in a predetermined spaced relation thereto;

said inner member being solid and having a bottom portion spaced away from the heat source to form a lower inlet opening, a top portion spaced away from the heat source a distance greater than that of the bottom portion to form an upper outlet opening, and an intermediate portion located between the top portion and the bottom portion and spaced from the heat source a distance intermediate of the distances at the bottom portion and the top portion;

a first cooling flow path defined between the heat source and the inner member and being adapted to convect heat away from said heat source and said inner member;

an outer member having an upper portion and a lower portion and being supported in at least partially covering predetermined spaced relation to the inner member; and

a second cooling flow path defined between the inner member and the outer member and being adapted to convect heat away from said inner and outer members.

4,612,768

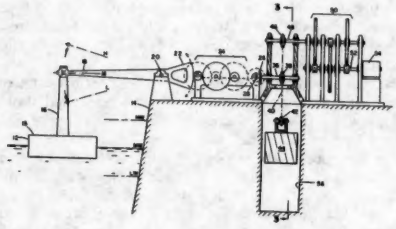
TIDE ACTIVATED GENERATOR

Randall Thompson, Jr., 3 Craige St., Cambridge, Mass. 02138

Division of Ser. No. 610,443, May 15, 1984, which is a continuation-in-part of Ser. No. 581,828, Feb. 21, 1984, Pat. No. 4,541,242. This application Sep. 16, 1985, Ser. No. 776,679

Int. Cl.[4] F03B *13/12;* F16H *19/04*

U.S. Cl. 60—506 2 Claims



1. Apparatus for mechanically storing energy derived from the rotation of a first shaft and a for driving a rotatable main shaft associated with a power generator comprising, in combination,

means for deriving energy from the rise and fall of a body of liquid for rotation of said first shaft,

said means comprising, in combination,

float means adapted to move substantially in a vertical plane in response to said rise and fall of said body of liquid,

means associated with said float means for converting said vertical movement into reciprocating rotational movement of a drive shaft,

a ratcheted differential adapted to convert said reciprocating rotational movement of said drive shaft into rotational movement of said first shaft in a single direction, said ratcheted differential being means for converting said vertical movement into reciprocating rotational movement of said drive shaft,

said means for converting said vertical movement into rotational movement in a single direction comprising opposing rack gears communicating with pinion gears mounted on a pair of shafts,

said pair of shafts communicating with said drive shaft, and

each of said pinion gears being ratcheted such that only rotational movement thereof in a predetermined direction is communicated to the shaft upon which it is mounted,

connecting means for communicating said rotation of said first shaft to a first sprocketed sheave, and

gear train means connecting said rotatable main shaft to a second sprocketed sheave and adapted to cause a rate of rotation of said rotatable main shaft greater than the rate of rotation of said second sprocketed sheave,

said first and second sprocketed sheaves being in communication with one another by means of continuous, flexible connecting means disposed on said first and second sprocketed sheaves in non-sliding relationship therewith,

said continuous, flexible connecting means having disposed thereon a weight which is raised by the rotation of said first sprocketed sheave,

said second sprocketed sheave being capable of being rotated by the descent of said weight to cause rotation of said rotatable main shaft,

said first sprocketed sheave and said second sprocketed sheave being adapted to rotate independently in response to rate of energy derivation and energy requirement, respectively, and

said weight disposed therebetween being adapted to be raised and lowered on said continuous flexible connecting means in automatic response to difference in energy derivation and energy requirement.

4,612,769

POWER CONTROL SYSTEM FOR A HOT GAS ENGINE

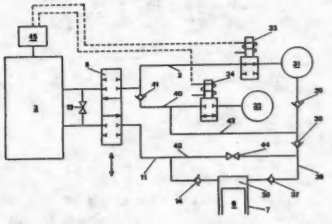
John O. Berntell, Staffanstorp, Sweden, assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,451

Claims priority, application Sweden, Aug. 6, 1985, 8503716

Int. Cl.[4] F02G *1/06*

U.S. Cl. 60—521 12 Claims



1. A power control system for a hot gas engine of the type in which the power output is controlled by varying the mean pressure of the working gas charge in the engine, said system comprising a high pressure working gas reservoir, a gas duct containing two series connected valves interconnecting said reservoir and the working gas chambers of a hot gas engine to be controlled, and a gas compressor the suction side of which is connected to the working gas chambers of the engine via a duct containing a non-return valve and an on-off valve connected in series, the delivery side of said gas compressor being connected to said reservoir through a duct containing a non-return valve, characterized in that the system also comprises a low pressure working gas reservoir provided with a valve governed connection, and a branch connection one end of which is branched off from said connection between the delivery side of the compressor and the high pressure gas reservoir, the said valve-governed connection to the low pressure gas reservoir also being branched off from said gas duct between said high-pressure gas reservoir and the working gas chambers of the engine at a location between the said two series connected valves, the branch connection containing a check valve allowing flow of gas only in the direction from said low pressure gas reservoir into the working gas chambers of the engine.

4,612,770

TURBOCHARGED ENGINE WITH EXHAUST PURIFIER

Tomoo Tadokoro; Ikuo Matsuda, and Haruo Okimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 26, 1985, Ser. No. 759,300

Claims priority, application Japan, Jul. 31, 1984, 59-161980; Jun. 10, 1985, 60-125535

Int. Cl.[4] F01N *5/04;* F02B *37/00*

U.S. Cl. 60—602 20 Claims

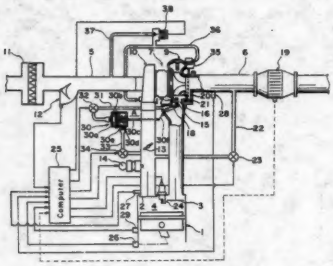
1. A control system for an automobile engine having intake and exhaust systems for respectively conducting intake gases to and exhaust gases from the engine, which comprises, in combination:

a turbocharger including a turbine disposed in the exhaust system and adapted to be driven by the flow of the exhaust gases therethrough and a blower disposed in the intake system and drivingly connected with the turbine for supercharging the intake gases;

an exhaust purifying device disposed in the exhaust system downstream of the turbine with respect to the direction of flow of the exhaust gases;

a regulating means for varying the effective cross-section of a portion of the exhaust system leading to the turbine;

a control means for controlling the regulating means in dependence on an operating condition of the engine, said control means causing the regulating means to decrease the effective cross-section during a low speed operating



condition, but to increase the effective cross-section during a high speed operating condition of the engine; and

a correcting means for controlling the regulating means to increase the effective cross-section during a particular engine operating condition associated with a cold start of the exhaust purifying device.

4,612,771

IDLING CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE WITH TURBOCHARGER

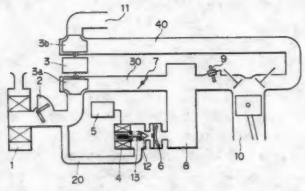
Hirohumi Ando, Kariya, and Takashi Kondo, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 16, 1984, Ser. No. 661,476

Claims priority, application Japan, Oct. 24, 1983, 58-199830

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—611 **2 Claims**



1. An idling control device for an internal combustion engine with a turbocharger, comprising:

an air intake pipe having an inlet at an upstream end thereof adapted to accept air which is to be supplied through the air intake pipe to the internal combustion engine and having an outlet at a downstream end thereof adapted to supply such air to said engine;

a turbocharger having a housing incorporated in said air intake pipe between said inlet and said outlet, this housing enclosing at least part of a rotary portion, so that at least some of the air being supplied to the engine is compressed by rotation of said rotary portion as such air passes through said housing, this turbocharger being adapted to contain a liquid lubricant for lubricating said rotary portion in relation to said housing;

a throttle valve incorporated in said air intake pipe between said turbocharger and said outlet, this throttle valve being adapted to vary the effective internal transverse cross-sectional area of said air intake pipe for correspondingly affecting supply of turbocharged air to said engine;

a surge tank incorporated in said air intake pipe between said throttle valve and said outlet;

a bypass air passage means provided in parallel with said air intake pipe between upstream of said turbocharger and downstream of said throttle valve, this bypass air passage means being adapted to supply air to said intake pipe upstream of said outlet, which air is not so compressed as said supply of turbocharged air;

a flow-control valve incorporated in said bypass air passage means, this flow control valve being adapted to vary the effective internal transverse cross-sectional area of said bypass air passage means, without extinguishing such area, for correspondingly affecting supply of bypass air to said engine;

an actuator operatively associated with said flow-control valve, this actuator being adapted to actuate said flow-control valve so as to constrict and dilate said area of said bypass air passage means;

a computer operatively associated with said actuator and arranged to receive signals relating to operating conditions of said engine and to operate said actuator in a predetermined manner in relation to such signals as are received thereby; and

a check valve incorporated in said bypass air passage means downstream of said flow-control valve, this check valve being oriented and adapted to prevent turbocharged air and mist of liquid lubricant escaping from sid turbocharger into said air intake pipe downstream of said turbocharger from flowing upstream in said bypass air passage means past said flow-control valve.

4,612,772

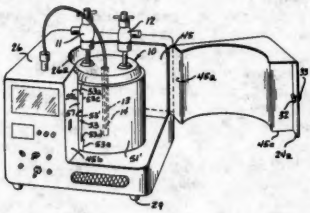
THERMO-ELECTRIC TEMPERATURE CONTROLLER FOR LIQUID CHEMICAL BUBBLER CONTAINERS

David E. Jones, 16533 Grove Creek Cir., Pecatonica, Ill. 61063

Filed Nov. 4, 1985, Ser. No. 794,681

Int. Cl.[4] F25B *21/02*

U.S. Cl. 62—3 **11 Claims**



1. A thermo-electric temperature controller for liquid chemical bubbler containers of the type having a bottom wall, a generally cylindrical side wall and a top wall with inlet and outlet fittings, a housing for enclosing the bubbler container and having top wall means and side wall means extending downwardly around the perimeter of the top wall means, a thermally conductive platform in the housing for supporting a bubbler container in heat exchange relation therewith, means including at least one thermo-electric device having a first thermal junction in heat exchange relation with the underside of the platform and a second thermal junction in heat exchange with an ambient heat exchanger for cooling or heating of the platform, the top wall means of the housing having an opening above the platform to allow the inlet and outlet fittings of a bubbler container to extend therethrough, the side wall means and top wall means of the housing including a door portion movable laterally of the housing between a closed position and an open position, said door portion in its open position providing an access opening in the side wall means of the housing of a size sufficient to allow movement of a bubbler container laterally into and out of the housing, first and second heat

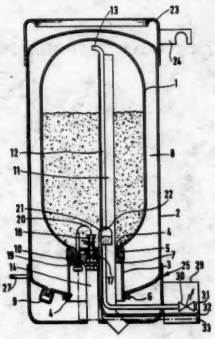
exchange members of thermally conductive material each having a semi-cylindrical inner side face, a pair of lengthwise extending side edges, and upper and lower end edges, the first heat exchange member having its lower end mounted on the platform in heat exchange relation therewith and with its concave inner side face facing toward the access opening in the housing to extend around one side of a bubbler container on the platform, the second heat exchange member being movable through the access opening in the housing into an enclosure forming position in which the concave inner side face of the second heat exchange member is in opposed relation with the concave inner side of the first heat exchange member to form a cylindrical heat exchange enclosure therewith, and means for releasably retaining the second heat exchange member in said enclosure forming position with the lengthwise extending side edges of the first and second heat exchange members in heat exchange relation with each other and with the lower end edge of the second heat exchange member in heat exchange relation with the platform.

4,612,773

CRYOGENIC LIQUID DISTRIBUTING DEVICE

Pierre Pelloux-Gervais, Seyssins, and Jean-Louis Neret, Morangis, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 13, 1985, Ser. No. 797,833
Claims priority, application France, Nov. 13, 1984, 84 17237
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—50 **13 Claims**



1. A device for distributing a cryogenic liquid comprising:
a cryogenic container having a double wall and which is inverted in the position of use of the device and comprises an interior reservoir and an exterior case each defining a single opening at a lower end thereof, and a neck interconnecting the two openings;
a plate fixed in the neck at an entrance of the interior reservoir, and
a cryogenic liquid supply conduit, a venting conduit and a pouring conduit, said three conduits extending through said plate in a sealed manner.

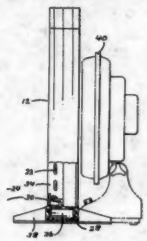
4,612,774

ICE COOLED FAN SCREEN APPARATUS AND METHOD

Paul A. Budreau, 1505 Valley Ridge, Austin, Tex. 78704

Filed Jul. 17, 1985, Ser. No. 755,723
Int. Cl.[4] F25D *3/00*
U.S. Cl. 62—59 **8 Claims**

1. An ice cooled fan screen apparatus comprising:
(a) a support frame;
(b) an ice receiving means mounted on top of said frame;
(c) a melted ice water transmission means connected to the bottom of said ice receiving means;
(d) a means for allowing ice water to exit said melted ice water transmission means;
(e) a melted ice chamber in the base of said support frame;
(f) a removable refreezing tray located within said melted ice chamber; and



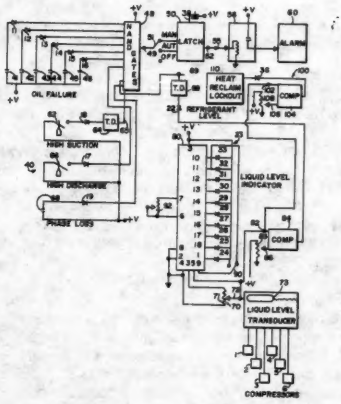
(g) a draining means connecting said positive shutoff valve to said removable refreezing tray by directing ice water to said removable refreezing tray.

4,612,775

REFRIGERATION MONITOR AND ALARM SYSTEM

Michael A. Branz, Dunwoody, and Paul F. Renaud, Conyers, both of Ga., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Continuation-in-part of Ser. No. 607,283, May 4, 1984, Pat. No. 4,553,400. This application Apr. 19, 1985, Ser. No. 725,124
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—126 **24 Claims**



1. A monitor for a refrigeration system including a heat reclaiming system coupled therewith, comprising:
a sensor positioned to detect the level of liquid state refrigerant in the system and provide an electrical output signal therefrom;
a digital display for displaying the refrigerant level;
first circuit means coupling said digital display to said sensor for actuating said digital display; and
lockout means coupled with said sensor for deactivating said

heat reclaiming system when a preselected refrigerant level is reached.

4,612,776

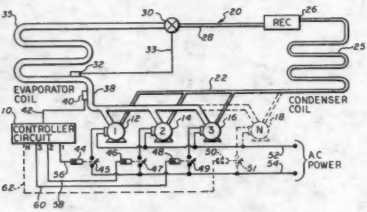
METHOD AND APPARATUS FOR CONTROLLING CAPACITY OF A MULTIPLE-STAGE COOLING SYSTEM

Richard H. Alsenz, 2402 Creek Meadow Dr., Missouri City, Tex. 77459

Continuation of Ser. No. 62,525, Jul. 31, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 257,113

Int. Cl.⁴ F25B *7/00*

U.S. Cl. 62—175 **24 Claims**



1. A method of controlling a compressor system having a preselected number of commonly piped compressors of inequal capacity and a common suction pressure load, comprising the steps of

establishing an operation suction pressure range having an upper limit and a lower limit,

detecting the suction pressure in the system and determining when said pressure exceeds said upper limit and when said pressure is below said lower limit,

providing an increase capacity signal when said operating suction pressure exceeds said upper limit and a decrease capacity signal when said operation suction pressure is below said lower limit, and

selectively energizing and deenergizing compressors in response to the respective increase capacity signals and the decrease capacity signals to provide a combination of energized unequal capacity compressors that exceeds in number the preselected number of compressors in the system so that the capacity of the system matches the common pressure load.

4,612,777

HUMIDIFIER UNIT FOR REFRIGERATED DISPLAY CABINETS

Kouichi Noma, Ota; Kazuto Matsuda, Gunma, and Toshio Sakurai, Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Jul. 26, 1984, Ser. No. 634,801

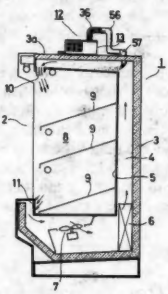
Claims priority, application Japan, Jul. 27, 1983, 58-138141; Aug. 10, 1983, 58-124568[U]; Aug. 18, 1983, 58-150585; Oct. 11, 1983, 58-157599[U]

Int. Cl.⁴ A47F *3/04*

U.S. Cl. 62—247 **8 Claims**

1. A refrigerated display cabinet comprising a heat insulating wall having one open side and an inner wall surface, a partition defining a storage chamber, said inner wall surface and said partition jointly defining a cooled air passage, a refrigerating unit and an air blower disposed in said cooled air passage, said cooled air passage including an outlet and inlet confronting each other and disposed upwardly and downardly of said one open side, a humidifier unit mounted on an upper surface of said heat insulating wall, said humidifier unit including an ultrasonic vibrator for generating a mist, and a pipe for delivering said mist generated by said humidifier unit into said cooled air passage,

said humidifier unit further comprising a body adapted to be mounted on an upper surface of the refrigerated display cabinet, a horizontally elongate atomizing water tank disposed in one side of said body and having a plurality of ultrasonic vibrators mounted on a bottom thereof and arrayed in a transverse direction thereof, an air blower disposed in an opposite side of said body for supplying air drawn from a suction port into said atomizing water tank. and pipes angularly movably mounted on said atomizing



water tank in coaction with said ultrasonic vibrators, respectively, for transferring said mist generated by said ultrasonic vibrators in said atomizing water tank and air from said air blower into the cooled air passage of said refrigerated display cabinet, all of said pipes together constituting said pipe for delivering said mist.

4,612,778

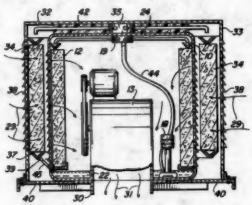
PRECOOLER FOR AN EVAPORATIVE COOLER

Michael V. Medrano, P.O. Box 131, Cashion, Ariz. 85329

Filed Feb. 14, 1985, Ser. No. 701,734

Int. Cl.⁴ F28D *5/00*

U.S. Cl. 62—311 **8 Claims**



1. A precooler for air flowing through ambient air inlets of an associated evaporative cooler comprising:

a jacket adapted to at least partially envelope the exterior of the associated evaporative cooler in upstream airflow relationship to said air inlets,

said jacket comprising an upright frame and porous media supported within said frame,

said media being capable of permitting the gravitation therethrough of cooling water and the transverse flow of ambient air so that the ambient air may be precooled by said media before entering said airflow inlets,

a manifold adjacent the upper portion of said media and adapted to discharge water into the latter for gravitation therethrough,

a first means for connecting said manifold to a source of cooling water in said associted evaporative cooler, and

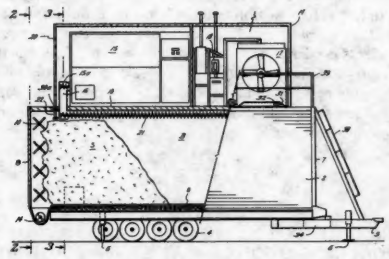
a second means for collecting water which gravitated through said media and for conveying it back to a sump in said associated evaporative cooler.

4,612,779

MOBILE ICE PLANT

James R. Hatton, 6700 N. 14th La., McAllen, Tex. 78504

Filed Jul. 1, 1985, Ser. No. 750,307
Int. Cl.[4] F25C 5/18
U.S. Cl. 62—344 13 Claims



12. A mobile ice plant for making and discharging fragmented ice, comprising:

fragmented ice-making means;

a mobile ice storage bin adapted to be disposed underneath said ice-making means to receive fragmented ice when the ice plant is in its ice-making position;

lifting means mounted within said storage bin for raising and lowering said ice-making means from a storage position within said storage bin to an ice-making position above said storage bin;

a plurality of continuous chains traversing power and idler sprockets on the floor of said bin for moving the fragmented ice stored within the bin toward one end of the bin;

a plurality of ice-breaker bars mounted on said end of said bin for separating the fragmented ice as it moves toward said bars; and

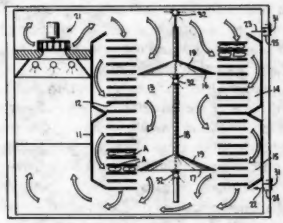
a screw conveyer mounted under said ice-breaker bars to transport separated ice fragments to any subsequent ice handling devices.

4,612,780

APPARATUS FOR AIR TREATING ARTICLES CARRIED ON A SPIRAL CONVEYOR

George C. Briley, and Peter Y. M. Pao, both of San Antonio, Tex., assignors to Refrigeration Engineering Corporation, San Antonio, Tex.

Filed Dec. 20, 1985, Ser. No. 811,340
Int. Cl.[4] F25D 25/02
U.S. Cl. 62—381 2 Claims



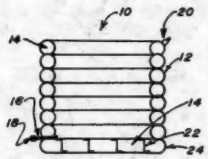
1. An apparatus for the air treating of articles, such as comestibles, comprising a cooling chamber having an open ended cylindrical upstanding housing mounted therein, an endless foraminous conveyor belt for the articles supported within said housing along a spiral path forming a central opening, a plurality of axially spaced, air deflecting baffles mounted within said housing in said central opening and extending transversely of said housing, said housing having internal, annular air reentrant chambers opening into said belt and associated with said baffles, means for feeding air through said housing from one end thereof and out through the opposite end of said housing, said baffles confining the flow of air directly through successive turns of said belt when the articles supported thereon have such a predetermined small size as to permit the free flow of air through said belt between opposite sides thereof, and said baffles deflecting the flow of air in lateral directions across the successive turns of said belt from said center opening, into said reentrant chambers and back to said central opening in a zigzag path when the size of the articles supported on said belt is greater than said predetermined small size so as to impede flow of air directly through said successive turns.

4,612,781

INFLATABLE INSULATED BARREL COOLER

Paul M. Swerdon, 316 Susquehanna St., White Haven, Pa. 18661

Filed Aug. 26, 1985, Ser. No. 769,268
Int. Cl.[4] F25D 3/08
U.S. Cl. 62—457 11 Claims



1. An inflatable barrel container comprising:

(a) a generally cylindrical container having an open top, a flexible, inflatable, closed bottom and a generally cylindrical, flexible, inflatable side wall(s), said container sized to approximately retain a barrel in spaced-apart registration with said wall(s), said side wall(s) including a plurality of interconnected, inflatable sections, said sections being generally tubular and attached to each other and interconnected to said bottom; and,

(b) a valve in one of said inflatable sections to permit inflation,

whereby when said collapsed container is inflated with air or the like gas through said valve, a semi-rigid container results which is self supporting, and a barrel may be easily placed inside said container with coolant placed in said space between said barrel and said wall(s), the barrel contents will thereby be kept at a constant temperature by the insulating value of said air-filled sections.

4,612,782

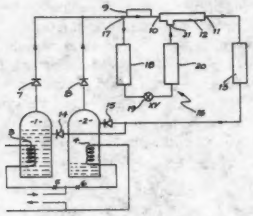
TWIN RESERVOIR HEAT TRANSFER CIRCUIT

John F. Urch, 35 Tintern Road, Ashfield, New South Wales 2131, Australia

Filed Jun. 7, 1985, Ser. No. 742,730
Int. Cl.[4] F25B 1/06
U.S. Cl. 62—500 11 Claims

1. Heat transfer means comprising circuitry defining a closed flow path for working fluid; a primary circuit forming part of said path and having two ends at one of which the working fluid is at a high pressure and at the other of which the working fluid is at a low pressure; a fluid supply reservoir and a fluid collection reservoir disposed respectively at said two ends; ejector means in said primary circuit; a drive fluid inlet, an exhaust outlet and a suction inlet provided on said ejector means; a branch circuit bridging a section of the primary circuit; an outlet end of said branch circuit connected to the suction inlet of the ejector means and an inlet end of the branch circuit connected to receive working fluid from the high pres-

sure end of the primary circuit; an expansion valve and an evaporative heat-exchanger connected in series in said branch circuit, the heat-exchanger being connected for flow therethrough of working fluid from the expansion valve to the suction inlet; means for cooling the fluid exhausting from the outlet of the ejector means and returning it in liquified form to



the fluid collection reservoir; heating means associated with the reservoirs and operable to raise the temperature of liquified working fluid in the fluid supply reservoir; and, valve means to interchange, periodically, the functions of the two reservoirs when the fluid supply reservoir is full and the fluid collection reservoir is empty.

4,612,783

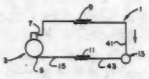
SELECTIVELY VARIABLE FLOWRATE EXPANSION APPARATUS

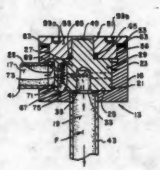
Denny W. Mertz, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 646,980, Sep. 4, 1984, abandoned. This application May 14, 1985, Ser. No. 733,909

Int. Cl.[4] F25B *41/06*

U.S. Cl. 62—528 **6 Claims**





1. A selectively variable flowrate refrigerant expansion apparatus for use in a refrigeration system having an evaporator, comprising a main body having a flow path, said flow path having an inlet and an outlet for the flow of refrigerant therethrough, said main body having a plug member sealably mounted therein, said plug member being selectively rotatable relative to said main body between a plurality of discrete flow positions, said plug member having an outlet manifold in communication with the outlet of said flow path in said main body, said outlet manifold being generally coaxial with the axis of rotation of said plug member relative to said main body, said plug member further having a plurality of orifice bores each of a predetermined cross secion extending generally radially outwardly from said outlet manifold to the outer surface of said plug member, there being one radial orfice bore for each of said discrete flow positions such that with the plug member in one of its discrete flow positions only one selected orifice bore is in communication with the inlet of said flow path such that a predetermined flow rate of refrigerant will pass through said selected one of said orifice bore and be discharged into the outlet manifold, each of said orifice bores having a ratio of its length to its cross section ranging between about 3 and 12 so as to at least in part serve as a capillary tube and to provide a sufficient pressure drop of the refrigerant flowing therethrough such that substantially all of said evaporator is wetted with liquid refrigerant and yet so that only refrigerant vapor is discharged from said evaporator under a given load for said evaporator.

4,612,784

CIRCULAR KNITTING MACHINE AND METHOD OF PRODUCING JACQUARD-PATTERNED PLUSH WEBS

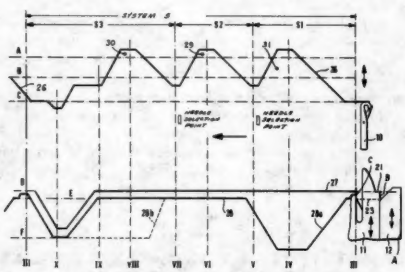
Ernst-Dieter Plath, Albstadt, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs-und Beteiligungs-Gesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 440,024, Nov. 8, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,847

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145307

Int. Cl.[4] D04B *9/12*

U.S. Cl. 66—9 R **3 Claims**



1. A multi-system circular knitting machine having a needle cylinder provided with a plurality of needles, a plate ring provided with plates arranged for movement into and out of a working zone of the needles, and control cams cooperating with the plates for producing jacquard-patterned one-face plush webs of a main thread and at least two plush threads whereby each plush thread is inserted in a selected needle in separate system portions of a series of system portions in each system and subsequently knitted together with the main thread into the mesh, the machine comprising,

separately controllable plates arranged in pairs with the number of pairs corresponding to the number of needles which are present in the needle cylinder, one plate in each pair being a loop sinking plate for processing the main thread, and the other plate being a knockover plate for processing the plush threads;

the series of system portions of each system of the machine including a first and a last system portion;

means for inserting the main thread in a needle and processing the main thread exclusively in the first system portion;

the shape of the control cams being such that in the first system portion the knockover plates only are withdrawn from the working zone of the needles while in the last system portion both the knockover plates and the loop-sinking plates are withdrawn from the working zone.

4,612,785

DIALS FOR CIRCULAR KNITTING MACHINES

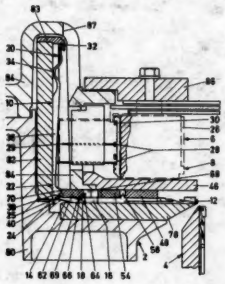
Arthur R. Smith, and Bertram Johnson, both of Leicester, United Kingdom, assignors to Bentley Engineering Company Limited, Leicester, England

Filed Nov. 29, 1984, Ser. No. 676,417

Claims priority, application United Kingdom, Dec. 23, 1983, 8334389

Int. Cl.[4] D04B 9/06, 35/02

U.S. Cl. 66—25 2 Claims



1. In a circular knitting machine of the type having a cylinder and a dial, the dial defining a needle bed having radially extending tricks, needles and associated actuator jacks being disposed in the tricks for radial sliding movement whereby the needles can be caused to selectively project from the needle bed, the actuator jacks and the needles having actuating butts thereon, said actuating butts projecting from the needle bed, said knitting machine further including a dial cam system, the needle bed and dial cam system being relatively movable, the cam system defining cam tracks for the jack actuating butts and the needle butts, the cam system including patterning means for actuating the jacks to cause needles to be selected for the appropriate sliding action, the improvement comprising:

the actuator jacks being at least in part fabricated from a comminutable plastic material while the remainder of the dial needle bed and dial cam system is comprised of materials which are harder than said comminutable material, said part of each of said jacks which is comprised of comminutable material including an entire actuating butt area whereby any portion of a said part of a jack butt area which becomes separated from the remainder of the jack will be ground up by contact with the harder dial components.

4,612,786

LATCH-TYPE NEEDLE FOR TRANSFERRING STITCHES

André Perotti, Couvet, Switzerland, assignor to Edouard Dubied & Cie. S.A., Couvet, Switzerland

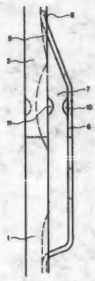
Filed Dec. 11, 1985, Ser. No. 807,737

Claims priority, application Switzerland, Dec. 18, 1984, 5994/84

Int. Cl.[4] D04B 35/04

U.S. Cl. 66—121 6 Claims

1. An improved latch-type needle for transferring stitches, of the kind having a needle shank, a needle hook, a latch, and a rigid, lateral clip arranged proximate said needle shank and defining a space therebetween for use in stitch formation and transfer in a knitting machine having opposite needle beds, the improvement comprising a first protrusion formed on the needle shank and a second protrusion formed on the clip, said first and second protrusion extending into the defined space between the clip and the shank to cooperate with the latch to



open a closed latch during transfer of stitches from a needle to needle.

4,612,787

ARRANGEMENT FOR CYLINDER LOCKS

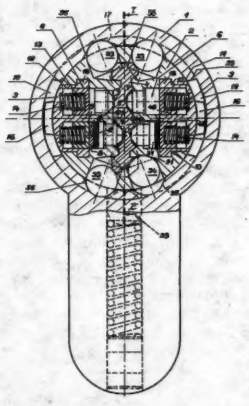
Kurt Prunbauer, Herzogenburg, and Adalbert Paar, Vienna, both of Austria, assignors to EVVA-Werk Spezialerzeugung Von Zylinder- und Sicherheitsschlössern m.b.H. & Co., Kommanditgesellschaft, Vienna, Austria

Filed Feb. 2, 1984, Ser. No. 576,534

Claims priority, application Austria, Feb. 4, 1983, 399/83; Jun. 28, 1983, 2373/83

Int. Cl.[4] E05B 27/06

U.S. Cl. 70—358 10 Claims



1. A cylinder lock arrangement having a cylinder housing and a cylinder plug rotatable about a central axis in said housing, said cylinder plug being formed with at least one axially directed recess, a blocking bar movable in axial direction in said recess in the cylinder plug between a blocking position in which it blocks the rotation of the plug relative to the housing and a releasing position, a key channel formed in said plug parallel to said recess, said key channel communicating with said recess via a plurality of radial bores in said plug, comprising a plurality of blind bores formed in said blocking bar; segmented pin tumblers arranged in said blind bores and in said radial bores so that upon insertion of a correct key the separation plane between the segments of the pin tumblers coincides with the separation plane between the blocking bar and the

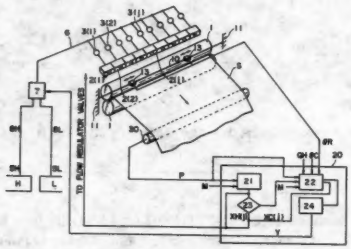
cylinder plug; and means arranged in said cylinder housing in the path of movement of the blocking bar to adjust the axial position of the latter when the plug is rotated by a key in the key channel.

4,612,788

METHOD FOR CONTROLLING SHAPE OF MATERIAL IN ROLLING PROCESS

Soichi Kitagawa, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 15, 1985, Ser. No. 798,398
Int. Cl.[4] B21B *37/10, 37/04, 27/06*
U.S. Cl. 72—13 2 Claims



1. A method for controlling the shape of a rolled strip in rolling operation in which coolant flow rates of roll coolant spray nozzles located at intervals along the barrel of a work roll are controlled accordingly to output signals of a shape detector adapted to detect the shape of the rolled strip in the widthwise direction thereof; said method essentially comprising the steps of:

switchably connecting by means of a change-over valve said roll coolant spray nozzle to one of a first main feed pipe for supplying a first cooling medium to the spray nozzles and a second main feed pipe for supplying a second cooling medium to said spray nozzles;

providing a temperature detector for detecting temperatures on the surface of said work roll;

switching said change-over valve to connect said second main feed pipe to said spray nozzles to feed said second cooling medium thereto when the flow rate of the first cooking medium reaches a maximum level and controlling the feed rate of the second cooling medium to each spray nozzle in proportion to a value calculated by multiplying the maximum feed rate of said first cooling medium by a ratio of the difference between the temperature of said first cooling medium and the temperature detected by said temperature detector to the difference between the temperatures of said second cooling medium and temperature detected by said temperature detector.

4,612,789

MAKING RINGS FROM TUBE OR BAR STOCK

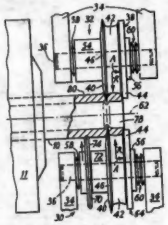
Ronald C. Andriessen, Cheltenham, England, assignor to Formflo Limited, Gloucester, England

Filed Jul. 30, 1984, Ser. No. 636,007
Claims priority, application United Kingdom, Aug. 3, 1983, 8320885
Int. Cl.[4] B21H *1/06*
U.S. Cl. 72—71 12 Claims

1. A method of making a succession of rings from cylindrical tube or bar stock having a free end comprising:

(1) supporting the stock on its axis and effecting relative rotation about said axis as between the stock and a rolling tool member capable of limited controllable axial movement, the tool member having a profiled tool surface for engaging and cold rolling the outer circumferential surface of an end portion of the stock terminating at said free end, said tool surface including an end stop portion for abutting said free end and a profiled parting portion for cold rolling a circumferential parting groove in the stock at the other end of the end portion, while

(2) advancing the tool member into simultaneous endwise and circumferential engagement with the stock, and then continuing said advance to form the parting groove, whereby the same tool member forms simultaneously therewith, on substantially the whole external surface of



the end portion, a positively rolled predetermined profile by cold rolling;

(3) halting the said advance when the end portion is nearly but not quite severed from the stock;

(4) subsequently completing severance of the end portion to constitute a said ring;

(5) radially retracting the tool member when it has finished operating on the stock; and

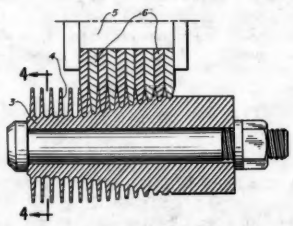
(6) axially feeding the stock forward by a predetermined amount ready for making the next ring.

4,612,790

METHOD OF DRAWING RIBS ON TUBES

Janusz Przybyla, Zabkowice Bedzinskie; Zygmunt Gozdziewicz, Kedzierzyn-Kozle; Andrzej Szal, Kedzierzyn-Kozle; Ryszard Zub, Kedzierzyn-Kozle, and Andrzej Maczynski, Gliwice, all of Poland, assignors to Zaklady Urzadzen Chemicznych Metalchem, Kedzierzyn-Kozle, Poland

Filed Jun. 19, 1984, Ser. No. 622,193
Int. Cl.[4] B21D *53/06*
U.S. Cl. 72—96 3 Claims



1. A method of forming ribs on pipes by means of rotating tools comprising formed discs, characterized in that initial compression stresses of a magnitude lower than that of the yield point of the pipe material are applied to the material of the pipe on which ribs are formed and, next the so-formed pipe is compressed by means of driven discs with their axes set at an angle until axial movement of the pipe has been caused and ribs of the shape resulting from that of the formed discs of the rotating tools have been formed under that pressure, that said initial compression stresses being retained in the pipe material throughout the entire rib forming cycle.

4,612,791

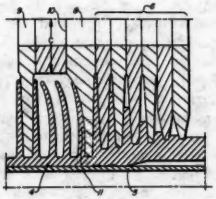
METHOD AND APPARATUS FOR ROLLING TRANSVERSELY RIBBED BIMETALLIC PIPES

Janusz Przybyla, Zabkowice Bedzińskie; Zygmunt Goździewicz, Kedzierzyn-Koźle; Andrzej Szal, Kedzierzyn-Koźle; Ryszard Zub, Kedzierzyn-Koźle, and Andrzej Maczyński, Gilwice, all of Poland, assignors to Zaklady Urzadzen Chemicznych Metalchem, Kedzierzyn-Ko le, Poland

Filed Jun. 19, 1984, Ser. No. 622,203

Int. Cl.[4] B21D *53/06*

U.S. Cl. 72—98 3 Claims



1. A method of rolling transversely ribbed bimetallic pipes, consisting of an inner core pipe and an external pipe said onto the core pipe, in which rotary tools with formed rollers are progressively applied to the assembled pipes, whereby the external pipe is initially cut, a rib is drawn, its shape is formed, the rib is bent and the external pipe is pressed to the core pipe and, in the final rolling stage, the rib is straightened, characterized in that the rib is bent in the direction of rolling along a parabolic curve after being formed and, next, the external pipe is tightly pressed onto the core pipe, the rib is bent and the external pipe is pressed during one revolution of the pipe, whereafter the rib is straightened.

4,612,792

METHOD OF MANUFACTURING FATIGUE RESISTANT CABLES

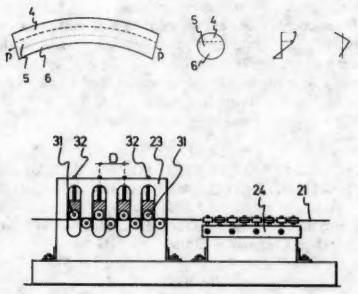
Marc De Bondt, Harelbeke; Urbain D'Haene, Kuurne, and Paul Dambre, Kemmel, all of Belgium, assignors to N. V. Bekaert S. A., Zwevegem, Belgium

Division of Ser. No. 345,585, Feb. 4, 1982, Pat. No. 4,481,996. This application Sep. 26, 1984, Ser. No. 654,376

Claims priority, application United Kingdom, Feb. 6, 1981, 8103671

Int. Cl.[4] B21D *3/05;* B21F *1/02*

U.S. Cl. 72—183 4 Claims



1. A process of treatment of a metallic cable into a cable comprising a number of wires with smooth surface having substantially their complete peripheral zone in a state of substantially uniformly distributed residual compressive stress, said process comprising providing a cable containing a plurality of wires and submitting said cable to a number of elementary bending-unbending operations, at least two of such operations being in considerably different planes, each elementary operation comprising bending the cable under simultaneous tensile stress into a curvature to an extent that the cross-section of a number of wires shows, consecutively in the direction towards the center of curvature, a zone of plastic elongation, a zone of elastic elongation, and a zone of substantially elastic compression, and then taking away the bending force producing said bending to form a cable with the said zones.

4,612,793

HYDROPNEUMATIC GUN FOR SETTING BLIND-RIVET NUTS

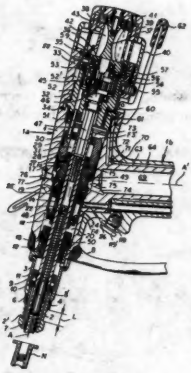
Günter Klein, Walldorf, Fed. Rep. of Germany, assignor to Gesipa Blindniettechnik Gesellschaft mit beschrankter Haftung, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,146

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306827

Int. Cl.[4] B21D *9/05*

U.S. Cl. 72—311 17 Claims



1. A tool for setting blind rivet nuts, the tool comprising:

a housing having a head defining a head axis;

a pulling rod extending along and rotatable about the head axis, projecting axially forwardly from the head, and threadable into a blind rivet nut;

hydropneumatic actuation means including a rear air chamber and a source of air under pressure for axially displacing the rod along the axis between an extended position projecting axially relatively far from the head and a withdrawn position axially therebehind;

pneumatic motor means connected to the pulling rod for rotating same in one sense to screw it into a rivet nut and for rotating the rod in the opposite sense direction to screw it out of the nut;

manually operable valve means connected to the motor means for rotating the rod in the one sense;

automatic valve means independent of the manual valve means and connected to the rod and between the rear chamber and the motor means for feeding air from the air chamber to the motor means and thereby automatically rotating the rod in the opposite sense on displacement of the rod by the hydropneumatic actuating means from the extended to the withdrawn position, said housing forming a liquid-filled hydraulic chamber adjacent the air chamber and the head forms a liquid-filled working chamber communicating with the hydraulic chamber, the hydropneumatic actuation means including;

a working piston in the working chamber and carrying the

rod, the piston being displaceable in the working chamber between a ready position juxtaposed with the tip and corresponding to the extended position of the rod and an actuated position spaced therefrom and corresponding to the withdrawn position of the rod;

an air piston displaceable in the air chamber between a front position corresponding to maximum volume of the rear air chamber and a rear position corresponding to minimum volume of same;

a hydraulic piston carried on the air piston and displaceable in the hydraulic chamber between an advanced position pressurizing the hydraulic chamber and corresponding to the front position of the air piston and a retracted position corresponding to the rear position of the air piston;

means for pressurizing the air chamber and thereby moving the air and hydraulic pistons into the respective front and advanced positions for pressurizing the working chamber and displacing the rod from the ready to the actuated position, whereby on displacement of the rod from the ready to the actuated position a rivet nut on the rod is upset, said manual valve means including a valve body normally projecting out of the housing, and said manual valve means includes a valve housing rotatable about the head axis on the head and carrying the valve body.

4,612,794
MANUAL CRIMPING PLIERS

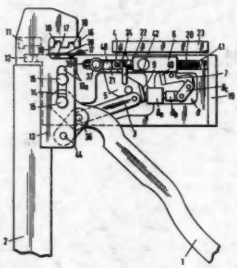
Dieter Schmidt, Rösrath, Fed. Rep. of Germany, assignor to HTS-Elektrotechnik GmbH, Neunkirchen, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,994

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 8402284[U]

Int. Cl.⁴ B21D *7/06*

U.S. Cl. 72—410 **6 Claims**



1. Manual crimping pliers for connecting contact elements to electrical conductors, the contact elements being supported on a carrier strip having holes located between adjacent contact elements, the manual crimping pliers including:

a grip,

a retaining plate firmly connected to the grip and including a lateral recess for accommodating the contact elements,

a stamping plate supported at an upper side of the recess, said stamping plate having cutouts open towards the recess,

a workplate displaceably guided on said retaining plate, said workplate having an upper side supporting crimping stamps,

a hand lever disposed opposite said grip and having one end pivotably connected to the retaining plate and to a support for said carrier strip,

said pliers further comprising:

a housing fixed to the workplate and including an upper edge, a groove disposed substantially parallel to said upper edge, and a feed spring disposed in the groove, the upper edge of said housing defining said support for said carrier strip,

linkage means pivotably connected between said hand lever and said housing,

a feed piece, displaceably supported in said housing groove for displacement at least toward said recess in a feeding direction, and carrying a dog for engaging in one of the holes in the carrier strip,

locking means, mounted in said housing, for releasably retaining said feed piece in a first position in which said feed spring is tensioned, and

triggering means for releasing said locking means, and thereby said feed piece from said first position, said triggering means being actuated by said linkage means,

whereby upon pivoting movement of said hand lever away from said grip, simultaneously said feed piece, said dog and said carrier strip are biased away from said first position toward said recess so that crimping of said contacts on said conductors can be effected, and thereafter when said hand lever is pivoted toward the grip, said locking means is actuated as said feed piece is moved back to its first position in said longitudinal groove.

4,612,795
METHOD OF FORMING A GROOVE IN A VALVE SEAT AND THE TOOL USED IN THIS METHOD

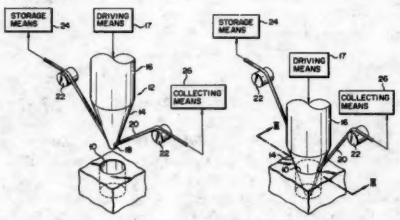
Kenji Yoshiga, Funabashi, Japan, assignor to Fuji Koki Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,975

Claims priority, application Japan, Oct. 27, 1983, 58-201370

Int. Cl.⁴ B21J *13/02*

U.S. Cl. 72—478 **4 Claims**



1. A method of forming a groove in an annular valve seat, comprising: detachably clamping a wire in a groove in an end surface of an end portion of a tool; the end portion having a hardness greater than said valve seat, the wire having a hardness greater than said valve seat and extending transverse to a circumferential edge of said valve seat, and moving a circumferential surface of said end portion with said wire thereon with pressure into linear or surface contact with said valve seat and thereby forming a groove in the form of an impression of the wire in the circumferential edge.

4,612,796
HYDRAULICALLY ACTUATED TOOLING CLAMPS FOR THE RAM AND BED OF A PRESS BRAKE AND THE LIKE

Dale C. Smyth, Jr., Lawrenceburg, Ind., assignor to Cincinnati Incorporated, Cincinnati, Ohio

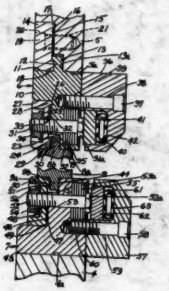
Filed Mar. 15, 1984, Ser. No. 590,517

Int. Cl.⁴ B21D *37/04*

U.S. Cl. 72—481 **10 Claims**

10. A tooling clamp for one of the opposed edges of the ram and bed of a press brake, said tooling clamp comprising a clamp body extending substantially the length of its respective one of said ram and bed, said clamp body having first and second sides and having a clamping surface thereon extending

the length of said clamp body and facing way from said second side, a plurality of substantially identical clamping bars each having a clamping surface thereon, said clamping bars being mounted on said first side of said clamp body in end-to-end relationship and with their clamping surfaces opposed to said clamp body clamping surface, each clamping bar being mounted on said clamp body by at least two bolts in parallel spaced relationship and each passing with clearance through a transverse perforation in said clamp body extending through said first and second sides, said clamping bars being shiftable away from said clamp body clamping surface to a release position and toward said clamp body clamping surface to a clamping position, said bolts each having a head at said second side of said clamp body, spring means in association with said



bolts normally maintaining said clamping bars in said clamping position, a housing affixed to said second side of said clamp body and extending substantially the length thereof, said housing having a cavity formed therein facing said second side of said clamp body, an actuating bar slidaby mounted in said housing cavity and extending substantially the length thereof, a vessel expandable by fluid under pressure located within said cavity and extending substantially the length thereof, said actuating bar having a first side in abutment with said heads of said bolts and a second side in abutment with said expandable vessel, whereby when said vessel is expanded by fluid under pressure, said actuating bar will shift said bolts, thus shifting said clamping bars against the action of said spring means to said release position.

4,612,797

LEAK LOCATING AND MAPPING SYSTEM AND METHOD

Sarkis Barkhoudarian, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

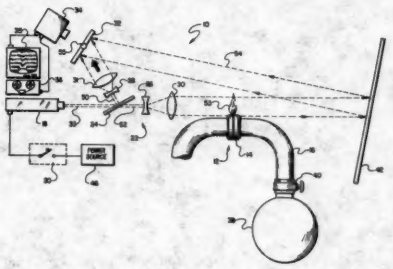
Filed Jun. 27, 1984, Ser. No. 625,473
Int. Cl.[4] G01M *3/04, 3/38*
U.S. Cl. 73—40.5 R **8 Claims**

1. A method of locating and measuring leaks from a test subject, said method comprising the steps of:

producing a reference holographic image of said test subject and any fluid surrounding the test subject, said holographic image being produced upon an image recording medium;

pressurizing said test subject;

producing a second holographic image of said test subject and any fluid surrounding said test subject, said second holographic image being produced during said pressurizing step upon said image recording screen, said second holographic image being superimposed over said reference holographic image to produce a hologram with an interference pattern; and



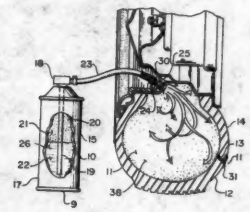
analyzing distortions in said interference pattern for purposes of locating and measuring leaks.

4,612,798

PNEUMATIC TIRE LEAK DETECTOR AND METHOD

Simon Roberts, 30543 Shoreham, Southfield, Mich. 48076

Filed Jul. 1, 1985, Ser. No. 750,591
Int. Cl.[4] G01M *3/20*
U.S. Cl. 73—40.7 **11 Claims**



10. A method for detecting the location of a leak in a pneumatic tire comprising the steps of:

(a) filling the interior of a leaking tire with an aerosol suspension comprising a powdered flourescent pigment of small particle size suspended in air and a propellant for flowing through and staining the perimeter of the leak on the outside of the tire;

(b) waiting for said suspension to stain the perimeter of the leak by flowing through the leak of the tire; and

(c) visually inspecting the outer surface of the tire to detect the staining of said surface by the escape of said suspension through the leak of the tire.

4,612,799

METHOD AND APPARATUS FOR MEASURING VISCOSITY

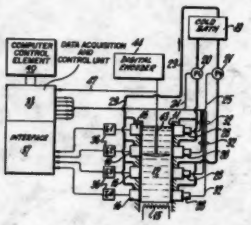
Frank H. Choi, Wappingers Falls; Samuel W. Rein, Poughkeepsie, and David L. Alexander, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 25, 1985, Ser. No. 791,640
Int. Cl.[4] G01N *11/12*
U.S. Cl. 73—54 **12 Claims**

1. Method of measuring viscosity of a lubricating oil at low temperature and low shear stress after a plurality of different cooling histories have been applied concurrently, comprising

subjecting an upstanding column of said lubricating oil to a predetermined high temperature throughout the length thereof,

cooling said column of oil at a plurality of vertically spaced locations with different cooling histories, and



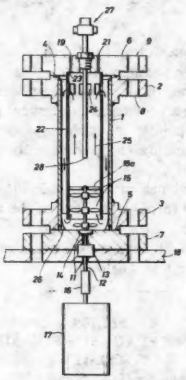
measuring the viscosity of said column of oil over all of said vertically spaced locations at a predetermined low temperature following the application of said cooling histories.

4,612,800

SLURRY VISCOMETER

Fadel F. Erian, Katy, Tex., assignor to Shell Mining Company, Houston, Tex.

Filed Apr. 8, 1985, Ser. No. 720,845
Int. Cl.[4] G01N *11/16*
U.S. Cl. 73—54 **16 Claims**



1. An apparatus for measuring slurry viscosity, comprising:

a vessel defining a closed loop flow path which is formed by at least one chamber within the vessel, the chamber having a top, bottom and sides, with the top and bottom being at least partially open and the sides being at least partially spaced from the vessel;

means for the simultaneous formation and circulation of the slurry through the closed loop flow path; and

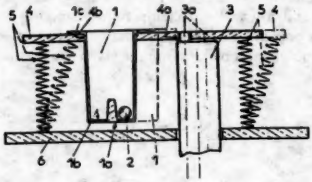
means for measuring the viscosity of the slurry as the slurry flows in the flow path.

4,612,801

COAGULOMETER AND METHOD OF MEASURING OF THE TIME OF COAGULATION OF SAMPLES OF FLUID PRODUCTS

Antoine Girolami, La Plaine, Route de Lascours, 13400 Aubagne, France

Filed Jun. 21, 1985, Ser. No. 747,524
Claims priority, application France, Jun. 27, 1984, 84 10427
Int. Cl.[4] G01N *33/48, 11/10*
U.S. Cl. 73—64.1 **12 Claims**



1. A method, for ascertaining the progress of coagulation of a sample of liquid, comprising the steps of:

(i) introducing the sample into a cup having its base shaped to form an endless path for rolling of a ball disposed in said cup,

(ii) imparting to the cup, with the ball and sample therein, a constant non-rotary circulating motion to cause the ball to roll, in the liquid, in said path, and

(iii) detecting the occurrence of a slowing of the rolling of the ball resulting from thickening of the liquid.

4,612,802

METHOD AND APPARATUS FOR RAPIDLY DETERMINING THE MOISTURE CONTENT OF A SUBSTANCE

Michael R. Clarke, West Vancouver, and Gary E. Troughton, Vancouver, both of Canada, assignors to Forintek Canada Corp., Vancouver, Canada

Filed Dec. 7, 1984, Ser. No. 679,313
Claims priority, application Canada, Mar. 14, 1984, 449578
Int. Cl.[4] G01N *19/10, 21/86*
U.S. Cl. 73—73 **17 Claims**

1. A method for use in rapidly determining the approximate moisture content of a piece of natural wood regardless of the thickness thereof and having an initial temperature, comprising:

(a) directing radiant energy of predetermined intensity toward a selected area on one surface only of said wood piece to subject said surface to a predetermined quantity of energy for a selected period of time without appreciably changing the temperature of the wood piece below said surface;

(b) measuring the temperature indicated by radiation from said selected area immediately following the application of said energy; and

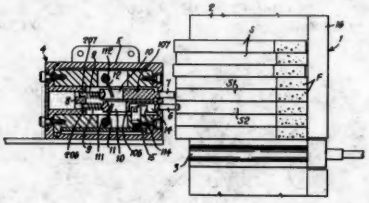
(c) comparing said measured temperature with said initial temperature, said temperature differences providing means to approximate the moisture content throughout said wood piece proximate said surface area on the basis that said rise in temperature is inversely proportional to said approximate moisture content.

4,612,803

CIGARETTE TESTING AND/OR LEVELING DEVICE

Renato Manservisi, Bologna, and Dario Cavicchi, Ferrara, both of Italy, assignors to Sasib S.p.A., Bologna, Italy

Filed Apr. 20, 1984, Ser. No. 603,285
Claims priority, application Italy, Apr. 22, 1983, 12497 A/83
Int. Cl.[4] G01N *3/48*
U.S. Cl. 73—81 17 Claims



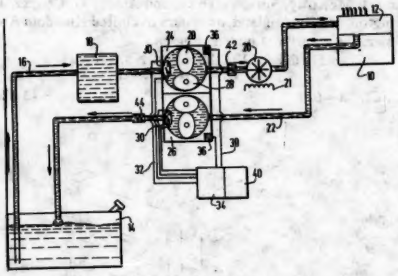
1. In a feeler pin device for rod-like articles having ends, said device being provided with at least one feeler pin which is arranged in a substantially co-axial relation with a respective article and which is moved axially from a retracted rest position toward the respective article so as to contact the end thereof and apply thereon an elastic pressure, the improvement wherein: the at least one feeler pin is held in its retracted rest position within a fixed support member against the bias of a respective biasing spring by control means which lets the at least one feeler pin move forward, relatively to the fixed support member, under the action of the respective biasing spring, toward the respective article, and which retracts the at least one feeler pin into the rest position, against the action of the respective biasing springs.

4,612,804

APPARATUS FOR MEASURING FUEL CONSUMPTION

Rino Colonnello, Soudan, France, assignor to Aero Product Europa, Soudan, France

Filed Aug. 30, 1983, Ser. No. 527,666
Claims priority, application France, Aug. 31, 1982, 82 14890
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—113 3 Claims



1. An apparatus for measuring the fuel consumption of a combustible engine mounted in a vehicle, the engine being of the type which comprises a fuel feed circuit placed between a tank and the engine and comprising a fuel pump and a circuit for returning the fuel from the engine to the tank, which apparatus comprises:

a first volume flowmeter having a range of measurement comprising low flow rates, mounted in the fuel feed circuit and intended to produce a first flow rate signal;

a second volume flowmeter having a range of measurement comprising low flow rates, mounted in the return circuit and intended to produce a second flow rate signal;

at least one heat sensitive compensation device intended to compensate at least one flow rate signal, according to the increase of volume of fuel between the temperatures of the flowmeters; and

a combining device intended to receive the two flow rate signals of which at least one is compensated, and to produce a consumed flow rate signal, said heat sensitive compensating device comprising:

a first temperature sensor associated with the first flowmeter and intended to produce a first signal representing the temperature of the fuel in the first flowmeter;

a second temperature sensor associated with the second flowmeter and intended to produce a second signal representing the temperature of the fuel in the second flowmeter; and

a device intended to compensate at least the first or the second flow rate signal according to the temperature signals from both sensors, the compensating device thus producing compensated signals of volume flow rate compensated according to the variation of apparent density of fuel with the temperature, wherein the two flowmeters are of a temperature compensated type such that, over the whole design range of the fuel temperatures, the same volume flow rate signal represents the same volume of fuel,

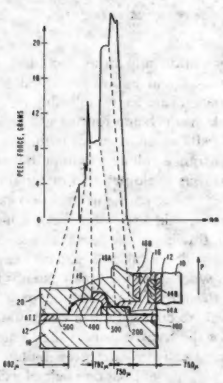
wherein the flowmeters are of a volumetric type with elliptical rotors, comprising a chamber and two elliptical rotors rotating in it, and the rotors and the chamber are made of materials having essentially the same coefficient of thermal expansion over the whole design range of the fuel temperatures.

4,612,805

ADHESION CHARACTERIZATION TEST SITE

James A. Bruce, Underhill, and Rajesh G. Narechania, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,867
Int. Cl.[4] G01B *21/08;* G01N *3/08, 19/04*
U.S. Cl. 73—150 A 22 Claims



15. A test site for gauging degrees of adhesion between various layers which are used in forming a multi-layered semiconductive device, comprising:

a layer of silicon nitride overlaying a semiconductive substrate;

a first conductive layer overlaying portions of said silicon nitride layer;

a first insulator layer overlaying portions of said silicon

nitride layer and said first conductive layer, said first conductive layer having a greater adhesion to said silicon nitride layer than said first insulator layer has to said first conductive layer, said first insulator layer thus forming a first test interface with said silicon nitride layer and a second test interface with said first conductive layer;

a second conductive layer overlaying a portion of said first conductive layer;

a second insulator layer overlaying at least said first insulator layer and said second conductive layer, said second conductive layer having a greater adhesion to said first conductive layer than said second insulator layer has to said second conductive layer, said second insulator layer thus forming a third test interface with said second conductive layer and a fourth test interface with said first insulator layer;

said first, second, third and fourth respective test interfaces being arranged in an end to end pattern to form a single continuous adhesion test interface, said layers of said test site separating along said single adhesion test interface during a single adhesion peel test to provide characterization of the degree of adhesions at each of said first, second, third, and fourth respective test interfaces.

4,612,806

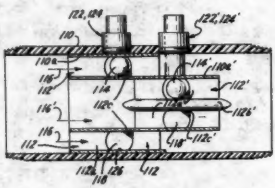
ORBITAL BALL FLOW DETECTION APPARATUS

Murray F. Feller, Box 1247, Dunnellon, Fla. 32630

Filed Nov. 2, 1984, Ser. No. 667,766

Int. Cl.⁴ G01F *1/32*

U.S. Cl. 73—195 **17 Claims**



1. Flow detection apparatus including means defining a fluid-flow passage and a flow-activated ball, said apparatus comprising track means for establishing an orbital path for said ball, said track means being formed at least in part of pellucid material, and ball detection means including a light source and a light sensor arranged along a light path that extends from said light source through said pellucid material to said orbital path and from said orbital path through said pellucid material to said light sensor, said apparatus further including means for directing fluid flowing in the passage so as to induce the ball to travel around said orbital path and to bear against the track means at least where said light path extends through said pellucid material to and from the orbital path, whereby the ball tends to prevent accumulation of contamination on the pellucid material of the track means at the light path.

15. An orbital ball flow detector, including means forming an inlet flow passage; at least one pair of axial-flow orbital ball flow detectors, each flow detector having means defining an axial-flow passage, an orbital ball and an orbital track for guiding the ball in a circular track coaxial with said axial-flow passage, and vane means for causing the fluid to swirl as it flows axially; and means providing a transition between the inlet passage and the multiple axial-flow passages; the swirl-causing vane means of said pair of flow detectors being arranged to cause the balls thereof to orbit in mutually opposite directions.

4,612,807

APPARATUS FOR DETERMINING THE WEIGHT PER UNIT AREA OF SHEET-LIKE MATERIAL

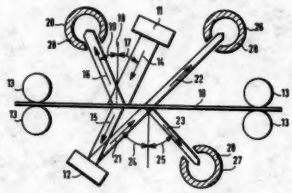
Bernd Wunderer, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft für Automation and Organisation mbH, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,858

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424652

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—580 **9 Claims**



1. An apparatus for dynamically determining localized weight per unit area of sheet-like material, for example, paper comprising:

a sound transmitter element spaced from the sheet-like material and emitting sound waves for application to the sheet-like material;

a receiver element for receiving the portion of the sound waves transmitted and/or reflected by the sheet-like material as a measuring signal;

measuring means coupled to said receiver element for determining the weight per unit area from the sound wave portions received by said receiver element;

said transmitter element, said receiver element, and the sheet-like material being arranged at angles relative to each other such that substantially none of the sound waves reflected by the sheet-like material return to the element from which they came; and

means for preventing reflected sound waves not forming part of said measuring signal from reentering the path of the sound waves between said receiver and transmitter elements.

4,612,808

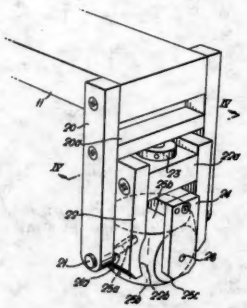
CONTACT ULTRASONIC PROBE HOLDERS

Bruce J. McKirdy, Summer Town, and Ashley G. Cooper, Warrington, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 19, 1985, Ser. No. 703,021

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—622 **13 Claims**



11. Apparatus for projecting a beam of ultrasonic energy

into a body having a curvilinear contour, said apparatus comprising a probe for producing said beam; a probe holder carrying the probe and presenting the probe for contact with said body; means for mounting the probe holder and traversing the probe holder over said body with the probe in contact with said curvilinear contour; said probe holder comprising:

(a) a ball element carrying the probe;

(b) gimbal means comprising a U-shaped inner frame having side legs between which the ball element is located and a U-shaped outer frame having side legs between which the inner frame is located;

(c) first pivot means interconnecting the ball element with the side legs of the inner frame;

(d) second pivot means interconnecting the side legs of the outer frame with the mounting means, said first and second pivot means defining respective first and second axes which are mutually orthogonal with respect to one another;

(e) third pivot means interconnecting the inner and outer frames whereby the inner frame is movable angularly relative to the outer frame about a third axis perpendicular to said first and second axes; and means for mechanically linking said outer frame and the ball element and operable automatically, in response to angular movement of said ball element about said first and second axes as the ball element traverses over said curvilinear contour, to effect compensating angular movement of the ball element about the third axis whereby a predetermined relationship between the direction of said beam and the mounting means is maintained.

4,612,809

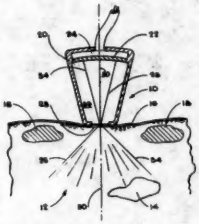
CURVED-ARRAY ULTRASONIC PROBE USING LOW-VELOCITY FLUID

Robert W. Cribbs, Placerville, and Claudio I. Zanelli, Fair Oaks, both of Calif., assignors to Sound Products Company, L.P., New York, N.Y.

Continuation-in-part of Ser. No. 436,182, Oct. 22, 1982, abandoned. This application Nov. 10, 1983, Ser. No. 550,914

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—626 **9 Claims**



1. An ultrasonic probe for medical diagnostic apparatus, comprising:

(a) a housing;

(b) a relatively thin, acoustically transparent window formed in said housing for application to a patient's skin, said window being formed of a material essentially nondeformable by said application of said window to said patients's skin having an acoustic velocity approximating that of human skin, and being sufficiently thin to substantially suppress reverberations within said window;

(c) a curved array of transducer elements disposed in said housing opposite said window;

(d) means for activating said elements in successive groups so as to produce a sector scan through said window, said fluid having a sound propagation velocity substantially slower than that of water.

4,612,810

OPTICAL PRESSURE SENSOR

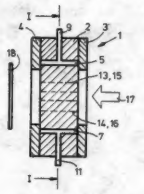
Gerhard Martens, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, Tarrytown, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,377

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3405026

Int. Cl.[4] G01L *9/00*

U.S. Cl. 73—705 **18 Claims**



1. An optical pressure sensor comprising, a light transmissive body, in communication with a pressure measurement chamber having an inlet opening for a liquid or gaseous medium subjected to pressure, said body being irradiated by polarized light, an analyser arranged in the direction of the light irradiation and behind the body and which filters from the light having a pressure-dependent condition of polarization linearly polarized light having an intensity which varies with the pressure in the pressure measurement chamber, characterized in that the pressure measurement chamber comprises a cavity inside the light transmissive body.

4,612,811

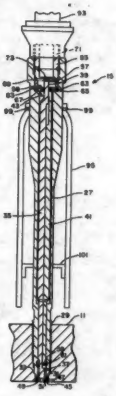
TEMPERATURE COMPENSATING PRESSURE GAGE

Niel L. Sarasohn, Felton, Calif., assignor to Gentran, Inc., Sunnyvale, Calif.

Filed Jun. 14, 1985, Ser. No. 745,306

Int. Cl.[4] G01L *7/08, 9/04, 19/04*

U.S. Cl. 73—706 **5 Claims**



1. In a pressure gage, an elongated body having an opening therethrough, a pressure sensitive tip secured across one end of said body and adapted to be placed in an environment of pressure to be measured, first and second sensors secured adjacent the opposite end of said body, a first force rod operably disposed between said tip and one of said sensors whereby pressure applied to said tip as well as variations in relative elongation of the body and said first force rod due to temperature differences and the like are applied to said sensor through said first force rod, a second force rod within said body and opera-

bly disposed between a fixed position at said one end of said body adjacent to but spaced from said tip and the other of said sensors whereby variations in relative elongation of the body and said second force rod due to temperature differences and the like are applied directly to said second sensor.

4,612,812

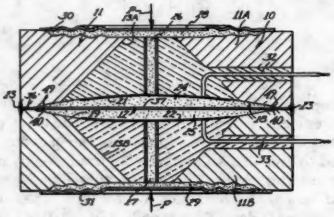
STRESS REDUCING STOP FOR UNSTRETCHED PRESSURE SENSING DIAPHRAGM

David A. Broden, Chanhassen, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Aug. 15, 1985, Ser. No. 766,123

Int. Cl.[4] G01L 9/12

U.S. Cl. 73—718 **8 Claims**



5. A capacitive pressure transducer for providing a capacitive signal representative of applied pressure comprising:

a diaphragm mounted for deflection by the applied pressure having a central plate portion having first and second sides forming a first capacitor plate, a peripheral mounting ring surrounding the central plate portion and a web portion thinner than the central plate portion, said web portion extending between the ring and central plate portion and joined to the ring and the central plate portion;

a second capacitor plate mounted in a fixed relationship with respect to the peripheral mounting ring, said second capacitor plate being spaced from the first side of the central plate portion and having a shape conforming generally to a first deflected position of the central plate portion; and

first stop means for limiting the deflection of the outer peripheral edge of the central plate at a second deflected position, said second deflected position being at less deflection of the central plate portion than said first deflected position.

4,612,813

APPARATUS FOR AN ULTRASONIC MEASURING OF A FLOW QUANTITY AND A METHOD OF ULTRASONICALLY MEASURING A FLOW QUANTITY

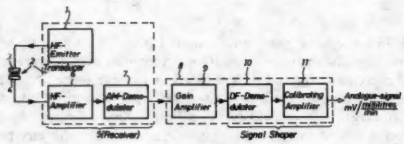
Alfred Rechsteiner, Uster, Switzerland, assignor to Doltron AG, Uster, Switzerland

Filed Feb. 25, 1983, Ser. No. 469,644

Claims priority, application Switzerland, Feb. 26, 1982, 1216/82

Int. Cl.[4] G01F 1/66

U.S. Cl. 73—861.25 **17 Claims**



1. An apparatus for an ultrasonic measuring of the quantity of liquid flow within a plastic hose by means of emitter means emitting a predetermined high frequency output signal having a frequency in a range of 2 to 15 MHz, said apparatus having transducer means electrically connected to said emitter means and emitting a signal which is proportional to the flow velocity of the liquid and operatively associated to a section of said hose for transmitting said signal of said transducer means into the liquid flowing through said section of said hose and for receiving a signal backscattered by the liquid flowing through said section of said hose and having further a signal shape analyzer electrically connected to said transducer means generating an output signal which is proportional to the quantity of flow of said liquid flowing through said hose wherein said transducer means comprises two oscillator elements designed to make contact with the outer surface of said section of said hose; said transducer means further comprising a demodulator means having at least one selectively controlled amplifier connected to one of said oscillator elements and a demodulator connected to said amplifier; said amplifier and said demodulator providing an output signal comprising an intelligence signal provided by the liquid flowing through the hose and a disturbance signal provided by the hose and the ratio of the intelligence signal to the disturbance signal amounts to at least 2:1, and said analyzer having at least one control amplifier connected to said demodulator means, a further demodulator connected to said control amplifier and a calibrating amplifier connected to said further demodulator in order to generate a DC-signal which is proportional to the quantity of flow of the liquid flowing through said section of said hose.

4,612,814

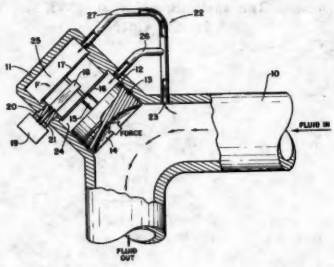
FLOW METER AND DENSITOMETER APPARATUS

Keith S. Campman, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 337,352, Jan. 6, 1982, abandoned. This application Jun. 29, 1983, Ser. No. 508,768

Int. Cl.[4] G01F 1/28

U.S. Cl. 73—861.72 **7 Claims**



1. A flowmeter apparatus, for measuring the flow rate of a fluid stream, the apparatus comprising:

a first conduit section having an inlet end and an outlet end, the conduit section is adapted for carrying a fluid stream from the inlet end, through the conduit section, and discharging the stream through the outlet end;

a chamber defined within the conduit section;

a piston member defined generally by a piston head and a rod secured to the head, the piston is positioned slidably within the chamber, and the piston head has a fluid contact face positioned at an angle to the fluid stream to contact a portion of the fluid stream which flows through the first conduit section;

a force measuring means which is positioned in the chamber above the piston member, so as to separate a first compartment defined between the piston and the force measuring means, from a second compartment defined within the chamber above the force measuring means, the force measuring means being in contact with the piston member;

a second conduit section which communicates with the first conduit section and with the first and second compartments, and the second conduit section is adapted for diverting a portion of the fluid stream into each of said compartments as the fluid stream flows through the first conduit section; such that

the portion of the fluid stream which is diverted through the second conduit section into the first and second compartments, in the chamber, exerts a fluid pressure in said compartments which is equal to the fluid pressure of the portion of the fluid stream which flows through the first conduit section; and

the fluid stream which flows through the first conduit section strikes the piston head fluid contact face and exerts a force on the piston member, said force being measured by the force measuring means; and

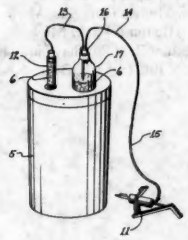
the flow rate of said fluid stream can then be derived as a function of said force.

4,612,815

METHOD AND APPARATUS FOR SAMPLING HAZARDOUS MATERIAL

Dennis A. Green, 4835 E. Kachina Trail #5, Phoenix, Ariz. 85044, and Thomas L. Purcell, 8737 E. Hubbell St., Scottsdale, Ariz. 85257

Filed Feb. 14, 1985, Ser. No. 701,390
Int. Cl.⁴ G01N *1/14*
U.S. Cl. 73—864.11 **6 Claims**



1. Portable apparatus for sampling material in a container comprising:

a foot-operated pump capable of generating both a partial vacuum less than atmospheric pressure and a pressure exceeding atmospheric pressure;

a specimen bottle;

a collection tube for insertion into the container containing the material to be sampled;

means for coupling the collection tube and the specimen bottle; and

means for coupling said foot-operated pump to said specimen bottle.

4,612,816

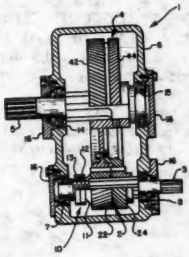
GEAR ASSEMBLY

Lazar Chalik, 10 Edgebrook Dr., West Hartford, Conn. 06117

Filed Oct. 28, 1983, Ser. No. 546,726
Int. Cl.⁴ F16H *35/08*
U.S. Cl. 74—401 **4 Claims**

1. A gear assembly for transmission between a drive shaft and a driven shaft comprising:

a. two meshing gears, one mounted to said drive shaft and one to said driven shaft, each of said gears having coaxially disposed first and second toothed portions, the teeth of the first toothed portion of each of said gears being at a first inclination angle and the teeth of the second toothed portion of each of said gears being at a second inclination angle, said first and second inclination angles having the same pitch direction and having different values, the first toothed portions of said gears having interengaging teeth and the second toothed portions of said gears having interengaging teeth thereby establishing a mating relationship between said gears whereby a driving relationship is established between said shafts, one of said gears being



axially displaceable with respect to the other of said gears; and

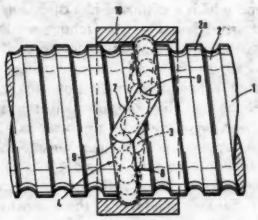
b. preloading means engaging said displaceable gear for applying an axially directed load to said displaceable gear to urge said displaceable gear against said other gear.

4,612,817

CIRCULATING BALL WORM DRIVE

Karl Neff, Waldenbuch, Fed. Rep. of Germany, assignor to Neff Gewindespindeln GmbH, Waldenbuch, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,373
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323345; Jun. 29, 1983, 3323347
Int. Cl.⁴ F16H *1/18, 1/20, 55/08*
U.S. Cl. 74—424.8 NA **22 Claims**



1. Circulating ball worm drive having

a worm nut (**10**) formed with a helical track (**6**) therein, a worm spindle (**1**) formed with a helical groove (**2**) at its circumference, and balls (**3**) retained between said track and groove and forming a worm drive connecting the nut and the spindle,

a recirculating connection (**7**) between adjacent turns of the helical track in the nut, formed in the nut and connecting a terminal portion of one turn of the track with an adjacent terminal portion of said one turn to permit endless recirculation of the balls in the track defining that turn,

wherein the nut comprises

a sleeve-like nut body (**10**) formed with an inner bore;

wherein an insert strip (**4, 4'**) is provided, forming and defining said track, said insert strip being shaped, in cross section, of essentially half-round configuration, said insert strip receiving said balls (**3**) and having a helical portion matching said track, extending over a major extent of one turn only of the helical groove (**2**) and a recirculating connection portion (**7**) extending between lateral neighboring terminal portions of the helical portion of the insert strip;

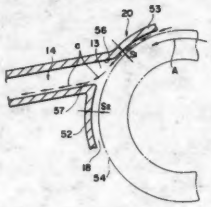
and wherein the insert strip (4, 4') comprises shaped sheet metal of substantially uniform cross section.

4,612,818

LUBRICATING STRUCTURE OF DIFFERENTIAL CARRIER FOR VEHICLE

Hiroshi Hori; Kiyoshi Taniyama, and Katumi Huruhata, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 10, 1985, Ser. No. 690,265
Claims priority, application Japan, Feb. 1, 1984, 59-15004
Int. Cl.[4] F16H 57/04; F01M 11/02
U.S. Cl. 74—467 4 Claims



1. A lubricating structure of a differential carrier for a vehicle having a ring gear, comprising:

a housing;

a drive pinion shaft attaching portion located in said housing wherein a single oil supply hole and an oil return hole extend respectively along and are provided on opposite sides of the drive pinion shaft attaching portion;

a ring gear attaching portion extending along an axis of said gear and which is disposed in a direction crossing an axis of said drive pinion shaft attaching portion;

a first portion of said housing being located on a lower side of said single oil supply hole, an inner surface thereof extending from a lower surface of said oil supply hole and formed substantially coaxially with the ring gear; and

a second portion of said housing located on an upper side of said oil supply hole, an inner surface thereof extending from an upper surface of said oil supply hole, formed substantially coaxially with the ring gear and having a smaller diameter than that of the inner surface of said first portion such that an oil hitting portion is formed at an upper surface of said oil supply hole by the difference in diameter of the inner surfaces of said first and second portions.

4,612,819

TORQUER FOR GYROS

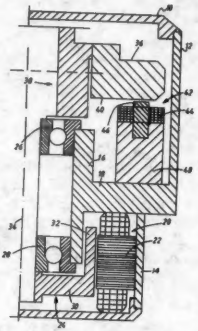
Hagen Kempas, Kreuzstrasse 25 A, D-7770 Überlingen 12, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,380
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346185
Int. Cl.[4] G01C 19/28, 19/30
U.S. Cl. 74—5.46 9 Claims

1. Torquer for exerting a torque by means of current-carrying coils acting on a gyro rotor which is rotating about a spin axis, characterized in that

(a) the coils (44) have ferromagnetic cores (46), are aligned substantially axially with regard to the spin axis and arranged adjacent a ferromagnetic surface (40) of the gyro rotor (36), which surface is substantially to the spin axis, and

(b) the coils (44) are supported on force-measuring sensors (48) which are acted upon by the forces of reaction acting



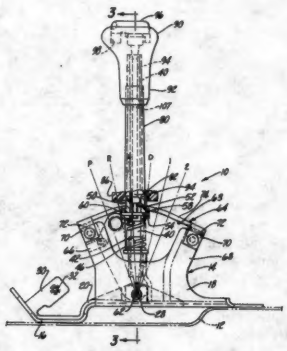
on the coils (44) and the signal of which provide a torque signal proportional to the torque exerted.

4,612,820

AUTOMATIC TRANSMISSION SHIFT SELECTOR MECHANISM

William L. Behrens, Madison Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 3, 1985, Ser. No. 740,704
Int. Cl.[4] G05G 5/06
U.S. Cl. 74—475 6 Claims



1. A shift lever mechanism for use with a vehicle automatic transmission comprising; support means, a selector lever provided with a handle end and a pivot end, said lever pivot end mounted on said support means for pivotal movement about a transverse pivot axis in a longitudinally extending vertical plane, an arcuate shaped sector plate fixed to said support means defining a cylindrical portion formed substantially concentric with said transverse pivot axis providing a convex upper surface and a concave undersurface, said sector plate having a longitudinally extending detent slot receiving said lever therethrough, said slot including a series of interconnected notches having progressively decreasing widths in both its fore and aft directions from a central maximum width notch, said central notch defining fore and aft paired transverse locator edges, and said fore and aft progressively decreasing width notches each defining associated transverse locator edges, a plunger supported on said lever for limited axial travel thereon, resilient means biasing said plunger axially toward

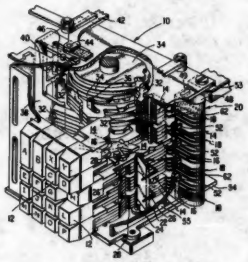
said lever handle end, means on said handle end operative to move said plunger axially toward said lever pivot end, said plunger formed with a pair of wall portions extending transversely outwardly from said lever, each said wall portion forming a plurality of paired mirror image step-up blocks wherein each pair of blocks define riser and tread surfaces, each said wall portion pair of successive outermost and next outermost step-up blocks having a predetermined size in relation to said detent slot central notch and its next adjacent fore and aft notches, respectively, wherein said plunger being retained at a predetermined fore or aft location in said central notch by the next adjacent pair of step-up blocks engaging their associated fore and aft transverse central notch locator edges, with said outermost treads in resiliently biased contact with said sector plate concave undersurface, thereby defining a pair of transmission operating modes, and wherein upon said plunger being initially moved axially a predetermined distance toward said lever pivot end by said handle operating means said lever being free for subsequent longitudinal movement in either a fore or aft direction, such that the next adjacent pair of of step-up blocks clearing their associated central notch transverse locator edges, whereby said plunger being retained by virtue of the next succeeding notch transverse locator edges engaging the next adjacent pair of step-up blocks thereby defining an additional pair of fore and aft transmission operating modes and so forth.

4,612,821

SPRING SYSTEM FOR PUSH-BUTTON CONTROL IN A SEWING MACHINE

William Weisz, Tenafly, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 28, 1983, Ser. No. 461,827
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—483 PB **5 Claims**



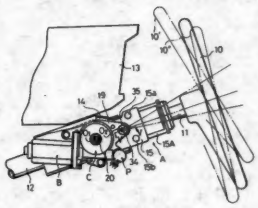
1. In a push-button control module, a plurality of slidable push-buttons which are movable by an operator from unactuated to actuated positions, said push-buttons including rearwardly extending portions terminating in a vertical column; and a spring assembly for use in moving the push-buttons from the actuated to unactuated positions, the assembly including a plurality of wire springs, and a fixed upright member wherein there a plurality of transversely extending longitudinally spaced grooves in which the wire springs are retained and from which the springs extend transversely with respect to the directions of movement of the push-button extensions to bring free ends of the spring into engagement with the extensions, the springs being individually preloaded against the extensions in the unactuated positions of the push-buttons.

4,612,822

TILT STEERING EQUIPMENT

Masumi Nishikawa, Toyoake; Masanobu Ishikawa, Nagoya; Hiroki Sato, Aichi; Shuhei Toyoda, Toyota, and Hakumi Ishii, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 13, 1984, Ser. No. 620,337
Claims priority, application Japan, Jun. 13, 1983, 58-105209; Jun. 13, 1983, 58-105210; Jun. 13, 1983, 58-90069[U]
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 **13 Claims**



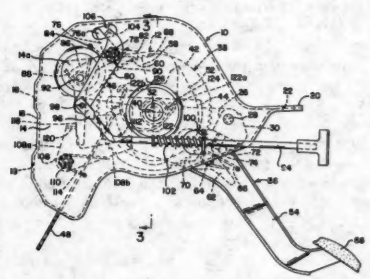
1. In a tilt steering equipment comprising:
a main bracket mounted to a vehicle body;
an upper bracket which rotationally supports an upper steering shaft having a steering wheel and which is pivoted to said main bracket around a tilt axis;
a driving means situated between said main bracket and said upper bracket for tilting said main bracket and said upper bracket in relation to each other around said tilt axis,
said driving means is fixed to one of said main bracket and said upper bracket and has a drive axis spaced from and approximately parallel to said tilt axis, and a first engaging means rotating around said drive axis, and
the other one of said main bracket and said upper bracket has a second engaging means being engaged by said first engaging means.

4,612,823

VEHICLE PARKING BRAKE MECHANISM

William L. De Leeuw, Sterling Hgts., and Kenneth R. Creighton, Canton, both of Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Sep. 23, 1985, Ser. No. 778,869
Int. Cl.[4] G05G *5/06*
U.S. Cl. 74—533 **23 Claims**



1. A vehicle parking brake operating mechanism comprising support means, brake cable tensioning means engaged with a brake cable and supported on said support means for displacement between cable tensioning and released positions, brake pedal lever means supported on said support means for dis-

placement between depressed and retracted positions, means biasing said pedal lever means toward said retracted position, means interengaging said pedal lever means and cable tensioning means and displacing said cable tensioning means to said cable tensioning position in response to displacement of said pedal lever means from said retracted to said depressed position, means releaseably holding said pedal lever means in said depressed position and said cable tensioning means in said cable tensioning position, and brake release means sequentially releasing said pedal lever means and cable tensioning means for displacement of said pedal lever means from said depressed to said retracted position and displacement of said cable tensioning means from said cable tensioning to said released position.

4,612,824

TRANSMISSION SYSTEM

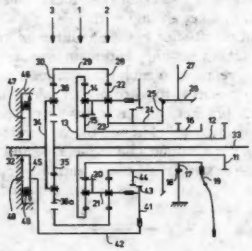
Günter Rühle, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to GETRAG Getriebe-und Zahnradfabrik GmbH, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,132

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345322

Int. Cl.⁴ F16H *37/06*

U.S. Cl. 74—665 F **5 Claims**



1. A transmission system for motor vehicles having at least two driven axles, comprising a transmission system case containing,

first and second differentials each including planetary gears, a sun gear, an internal gear and a planet gear carrier,

a two stage transmission including planetary gears, a sun gear, an internal gear and a planet gear carrier,

said two-stage transmission being located between said first and second differentials,

first and second hollow shafts concentrically arranged one with respect to the other and extending through one of said differentials and said planet carrier of said transmission,

means connecting said planet carrier of said transmission with said planet carrier of said one of said differentials,

a hollow body for containing said transmission,

said internal gears of said first and second differentials being mounted to an inner surface of said hollow body,

said sun gear of said transmission being mounted to said second hollow shaft,

said internal gear of said transmission being mounted to said first hollow shaft,

a gear fixed to said case, and

means for shifting said second hollow shaft between a first position where it is coupled to said gear fixed to said case to lock said sun gear of said transmission and a second position in rotatable engagement with said planet carrier of said transmission.

4,612,825

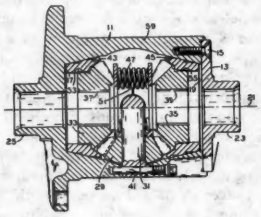
END CAP LIMITED SLIP DIFFERENTIAL

James L. Engle, Auburn, Ind., assignor to Auburn Gear, Auburn, Ind.

Filed Aug. 21, 1984, Ser. No. 642,832

Int. Cl.⁴ F16H *1/44, 57/02;* B23P *11/00*

U.S. Cl. 74—711 **17 Claims**



8. A limited slip differential mechanism comprising:

a housing formed by a two part case having a generally hollow barrel shaped interior with opposed generally planar first and second end walls and a bulged side wall formed as a surface of revolution, a first case part defining said barrel shaped interior and said first end wall and terminating in a planar mouth, a pair of frustoconical clutch surfaces formed on the interior of said first case part, a first one of said pair of clutch sufaces being formed in said side wall and diverging radially outwardly from the intersection between said first planar end wall and said side wall, a second one of said pair of clutch surfaces being formed in said sidewall and diverging radially outwardly from said planar mouth, a second case part comprising said second end wall and, with said planar mouth, forming a parting plane for said case;

axle shaft receiving hubs extending from the end walls coaxial with the axis of the surface of revolution; and

an access port in the side wall for assembling components within the interior.

4,612,826

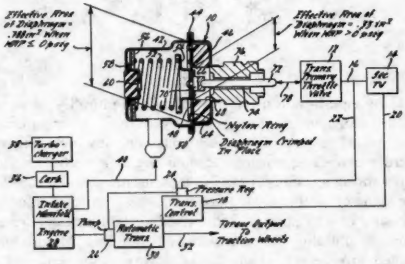
TRANSMISSION THROTTLE VALVE MODULATOR RESPONSIVE TO BOTH POSITIVE MANIFOLD PRESSURE AND NEGATIVE MANIFOLD PRESSURE

Thomas L. Greene, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 13, 1985, Ser. No. 701,059

Int. Cl.⁴ B60K *41/16;* F01B *31/00*

U.S. Cl. 74—863 **2 Claims**



1. In a throttle valve actuator for an automatic transmission used with an internal combustion engine having an air-fuel intake manifold and having means on the air intake side thereof for supercharging the effective pressure therein;

an actuator housing, a diaphragm in said housing cooperating with said housing to define a cavity on one side of said diaphragm, means for establishing pneumatic communication between said intake manifold and said cavity, spring means in said cavity for urging said diaphragm in one direction, the effective force on said diaphragm being the sum of the force of said spring and the pneumatic force of the pressure of said manifold;

a seal ring situated in said housing and on the opposite side of said diaphragm and having a central opening of less area than the total area of the diaphragm, the central portion of said diaphragm being received over the said opening;

a valve stem adapted to establish a mechanical connection between said central diaphragm portion and a transmission throttle valve whereby said throttle valve is subjected to an actuating force that is the sum of the effective force of the pneumatic pressure on said diaphragm and the spring force;

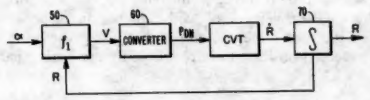
said opposite side of said diaphragm being adapted to establish a seal on said seal ring whereby the effective area over which a positive pressure in said manifold acts is equal to the area of the opening in said seal ring and wherein effective area of said diaphragm over which a negative pressure on said manifold acts is the total area of said diaphragm.

4,612,827

ACCELERATOR CONTROL FOR A VEHICULAR PROPULSION SYSTEM HAVING A CONTINUOUSLY VARIABLE RATIO TRANSMISSION

Takashi Omitsu, Madison, Wis., assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 30, 1984, Ser. No. 595,481
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—866 **14 Claims**



1. In a system for controlling the operation of a vehicular propulsion system including an engine having a relatively steep torque-speed characteristic defined by a critical engine speed range, and a continuously variable ratio transmission coupled to said engine for delivering usable power therefrom, said control system including command means operatively coupled to said transmission and providing an input thereto for controlling the ratio thereof and thereby commanding a desired propulsion system performance, the improvement comprising attenuator means operatively coupled to said command means and said transmission for attenuating the output of said command means within said critical engine speed range, thereby decreasing the sensitivity of said command means and smoothing the responsiveness of the propulsion system, and the attenuator means includes means to control the amount of attenuation of said output dependent on the output of said command means.

4,612,828

CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

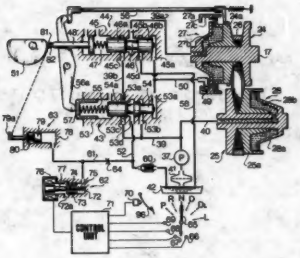
Tohru Ide, Hoya, and Minoru Okamura, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,678
Claims priority, application Japan, Apr. 20, 1984, 59-80853
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—866 **3 Claims**

1. An improved control system for an infinitely variable transmission for a vehicle powered by an internal combustion engine, the transmission having a shift lever for selecting operating ranges including a D/L range, an infinitely variable power transmitting device, a hydraulic circuit for operating the power transmission device, first detecting means for producing a first signal dependent on engine speed, a transmission ratio control valve provided in the hydraulic circuit and having a spool responsive to the first signal for controlling transmission ratio of the power transmitting device, wherein the improvement comprises:

first means for forcibly shifting the spool of the transmission ratio control valve in the downshift direction;

second detecting means responsive to operation of an accelerator pedal of the vehicle for producing a second signal;



a D/L-range switch for producing a third signal when the range is selected by the shift lever;

second means responsive to the second and third signal for operating the first means,

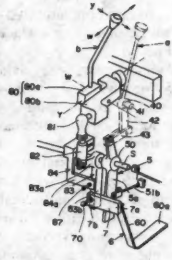
the second means being arranged to operate the first means to move the spool in the downshift direction in response to the second signal at the depression of the accelerator pedal, and to move the spool in the upshift direction opposite to the downshift direction in response to the second signal at the release of the accelerator pedal.

4,612,829

LEVER OPERATING DEVICE IN EXCAVATOR

Hiroshi Fukaya; Yuji Takada, both of Iruma, and Masao Tamachi, Tokyo, all of Japan, assignors to Handozer Industry Co., Ltd., Japan

Filed Aug. 17, 1984, Ser. No. 641,869
Claims priority, application Japan, Jun. 12, 1984, 59-87059[U]
Int. Cl.[4] G05G *9/00, 13/00*
U.S. Cl. 74—876 **2 Claims**



1. A lever operating device in an excavator for controlling the movement of the excavator tilt, comprising:

an accelerator arm interlocked with an accelerator lever and pivotally mounted on the excavator to control the speed of an engine on said excavator;

a pivotable arm interlocked with a control lever and pivot-

ally mounted on the excavator to control a valve for selectively turning on the drive unit for said tilt;

means mounting said levers on said machine for pivotable movement adjacent each other in parallel planes; and

an abutting plate secured integrally with said accelerator lever to extend at one end into the pivot path of said control lever;

said mounting means including means supporting said levers in such manner that said one end of the abutting plate is located in position to be engaged by said control lever to increase the speed of said engine, when said control lever is swung in the pivotal direction of turning on said controlling valve.

4,612,830

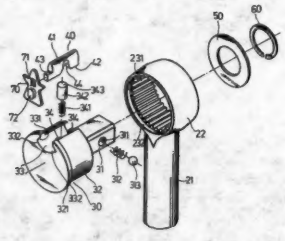
TORQUE WRENCH

Miriam Yang, No. 23, Lane 240, Li Jen Road, Da Li Hsiang, Taiwan

Filed Sep. 5, 1985, Ser. No. 772,667

Int. Cl.[4] B25B *13/46*

U.S. Cl. 81—63.2 **5 Claims**



1. A ratchet wrench comprising:

a cylindrical housing having a plurality of teeth each of which has two converging faces and projects inwardly from the inner side of the wall thereof;

a handle with its one end connected to the periphery of said housing;

a torque transmitting member which has a cylindrical body mounted in said housing and has a shaft extending from one end of said body out of said housing, said body having an axial groove opening at the peripheral surface of said body, a bore extending radially outward to communicate with said groove, and a protrusion means received in said bore and biassed radially, said groove being confined by two diverging surfaces which are symmetrical with the axis of said bore, two converging surfaces extending from said diverging surfaces respectively and being symmetrical with the axis of said bore, and two edges each of which interconnects said converging surface and the peripheral surface of said body;

a pawl means having a pawl body axially disposed in said groove and having an oblong cross-section in the plane perpendicular to the axis of said cylindrical body, said pawl body having a first longitudinal end portion to engage with said teeth, and a second longitudinal end portion which is opposite said first longitudinal end portion and is provided with a recess which receives said protrusion means, said second longitudinal end portion being movable between two corners formed by adjacent said diverging and converging surfaces by passing through said protrusion means to change said first longitudinal end portion from a first position, in which said first longitudinal end portion engages with said teeth to cause said cylindrical body to move anticlockwise together with said housing, to a second position, in which said first longitudinal end portion engages with said teeth to cause said cylindrical body to move clockwise together with said housing, said protrusion means thrusting said pawl body to cause said first and second end portions to engage said teeth and said corners respectively.

4,612,831

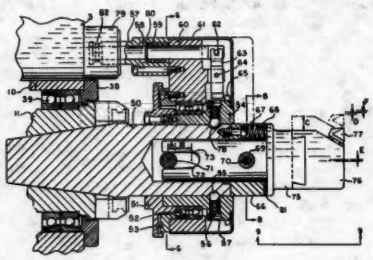
AUTOMATIC BORING TOOL

Robert A. Lehmkuhl, 7 Klara Ct., Madison, N.J. 07940

Filed Feb. 19, 1985, Ser. No. 703,091

Int. Cl.[4] B23B *3/26*

U.S. Cl. 82—1.4 **5 Claims**



1. In a boring machine having computer numerical control and of the class having a spindle for receiving a tool to form a bored hole and a servo-driven actuating unit to control the diameter of said bored hole comprising a tapered shank adapted to be received in said spindle, a pre-loaded adjustable boring bar with a cam slot pivotally secured to said tapered shank, a non-rotating torque arm on said tapered shank, a sliding sleeve carried by said torque arm, said torque arm being controlled in its linear position relative to the tapered shank by the servo-driven actuating unit, a cam bar mounted in said sliding sleeve to be received in the cam slot in said boring bar, whereby axial movement of said cam bar in response to a setting of the serv-driven actuating unit pivots the boring bar to a preselected position to bore a hole by the boring bar.

4,612,832

MULTIPLE-FUNCTION MACHINE TOOL WITH TWO SPINDLES

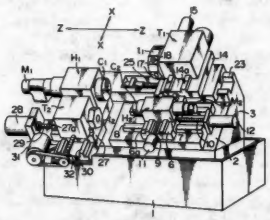
Tomio Ushigoe, Ueda; Takeo Kobayashi; Yoshitsugu Yoshinaga, both of Nagano; Keiro Tsuchiya, and Kazuo Miyagawa, both of Ueda, all of Japan, assignors to Kabushiki Kaisha Miyano Tekkosho, Nagano, Japan

Filed Apr. 8, 1985, Ser. No. 720,897

Claims priority, application Japan, Apr. 27, 1984, 59-87066; Oct. 29, 1984, 59-163370[U]

Int. Cl.[4] B23B *3/30*

U.S. Cl. 82—3 **3 Claims**



1. A two-spindle machine tool, comprising:

a support structure integrally supported on a base;

a first headstock fixedly supported on the support structure and having a first main spindle extending in a first direction and provided with a first chuck;

motor means operatively connected to said first main spindle for rotating the first main spindle;

a second headstock having a spindle head supporting a second main spindle extending in said first direction and provided with a second chuck in opposed facing relation with the first chuck;

motor means operatively connected to said second main spindle for rotating the second main spindle;

second headstock slide means mounted on the support structure and supporting thereon the spindle head of the second headstock, said slide means having a first slideway extending in said first direction and a second slideway extending in a second direction perpendicular to said first direction, said first and second slideway making the spindle head translationally movable in said first and second directions, respectively, while the second main spindle is constantly maintained parallel to the first main spindle, the positions thus assumable by the spindle head including a specific position wherein the first and second main spindles are aligned on a common axis;

driving means operatively connected to said spindle head for moving the spindle head in said first and second directions along said first and second slideways;

a first tool head for holding machining tools;

first tool-head slide means mounted on the support structure and supporting thereon the first tool head, said first tool-head slide means being disposed adjacent the movable range of the second headstock at one side of said common axis and having a first slideway extending in said first direction and a second slideway extending in said second direction, said first and second slideways making the first tool head translationally movable in said first and second directions, respectively;

servomotor means operatively connected to said first tool head for moving the first tool head in said first and second directions along said first and second slideways of the first tool-head slide means;

an indexable first turret mounted on the first tool head for holding various machining tools with a plurality of orientations, said first turret being positioned on the side of the first tool head facing the first headstock with respect to said first direction such that a machining tool held on the turret acts on a workpiece held by the first chuck or the second chuck;

a second tool head for holding machining tools;

second tool-head slide means mounted on the support structure and supporting thereon the second tool head, said second tool-head slide means being disposed adjacent the first headstock at the other side of said common axis, said second tool-head slide means having a first slideway extending in said first direction and a second slideway extending in said second direction, said first and second slideways making the second tool head translationally movable in said first and second directions, respectively;

servomotor means operatively connected to said second tool head for moving the second tool head in said first and second directions along said first and second slideways of the second tool-head slide means; and

an indexable second turret mounted on the second tool head for holding various machining tools with a plurality of orientations, said second turret being positioned on the side of the second tool head facing the second headstock with respect to said first direction such that a machining tool held on the turret can be caused to act on a workpiece held by the first chuck or the second chuck.

4,612,833

MACHINE TOOLS

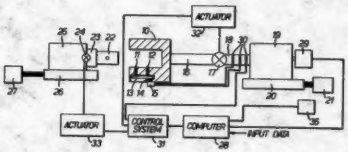
Roger H. Slee, Warwick, England, assignor to AE PLC, Warwickshire, England

Filed Sep. 11, 1984, Ser. No. 649,485

Claims priority, application United Kingdom, Sep. 21, 1983, 8325294

Int. Cl.[4] B23B 5/24

U.S. Cl. 82—18 **3 Claims**



1. A machine tool for machining piston blanks to have a non-uniform profile, comprising:

a workpiece holder for holding a piston blank nonrotatably,

a rotatable tool head of generally cylindrical shape open at one end for receipt of the piston blank.

a tool mounted on the tool holder for movement radially relative to the axis of the cylindrical tool holder, axial feed means mounting said workpiece holder and said tool head for relative axial movement along said tool holder axis,

a bar mounted on the tool head for pivoting movement about an axis on the tool head, one end of said bar engaging an outer end of the tool,

a electrical actuator servo motor mounted on the tool head and having an output engaging an end of the bar opposite said end engaging an outer end of the tool.

a shaft connected to the tool head for rotation of the tool head about the axis of the cylindrical tool head,

a drive motor connected to the shaft for rotating the shaft and the tool head,

angular position means operatively associated with said tool head for producing signals corresponding to the angualr position of the tool head.

axial feed position means operatively associated with said axial feed means for producing signals corresponding to the position of the tool head along the rotational axis of the tool head.

an electronic control system connected to the servo motor, the angular position means and the feed position means producing electrical control signals which correspond to said non-uniform profile and which are fed to said servo motor in accordance with said signals from said angular position means and said feed position means, whereby said servo motor pivots said bar about said axis to move the tool in said radial direction to machine the piston blank to said non-uniform profile.

4,612,834

CROSS SLIDE CONTOURING BOX TOOL

Harold E. Wheeler, 215 Wheelock Ave., Athens, Pa. 18810

Filed Nov. 2, 1982, Ser. No. 438,566

Int. Cl.[4] B23B 5/44

U.S. Cl. 82—19 **2 Claims**

1. A polygon box tool comprising:

a main housing;

a front housing secured to said maind housing, said front housing including a bottom plate with a centrally aligned aperture therein;

a lightweight transverse slide in said front housing;

a cam in said main housing juxtaposed said front housing;

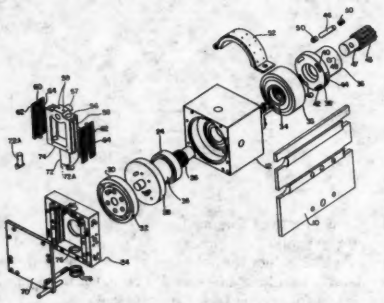
said cam including at lest one cam face;

a groove in said at least one cam face, said groove having a plurality of greater and lesser radii portions therein;

said cam including a camshaft which extends through said

main housing for rotating said cam in said main housing through many revolutions per second during one milling operation;

a cam follower pin extending from said transverse slide and extending into said groove in said at least one cam face for positively reciprocating movement of said transverse slide during rotation of said cam through many revolutions per second by said camshaft, and



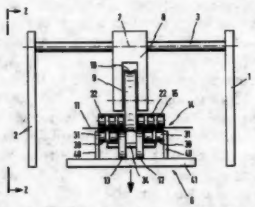
means for securing a contouring form tool on said transverse slide, said means being in alignment with said aperture in said bottom plate of said transverse slide for reciprocation of said contouring form tool in said aperture by said cam follower during each rotation of said cam through said many revolutions per second.

4,612,835

DEVICE FOR CUTTING OUT A WASTE STRIP BETWEEN TWO USABLE STRIPS

Hagen Gämmerler, Icboring 44, D-8021 Icking, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 691,924
Int. Cl.[4] B23D *19/06*
U.S. Cl. 83—500 **9 Claims**



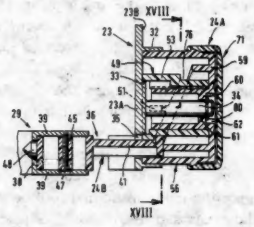
1. A device for continuously cutting out a waste strip between two usable strips of sheet structures comprising a circular cutting wheel rotatably mounted about an axis on a first shaft, said cutting wheel having two axially spaced symmetrical cutting edges about its circumference; a pair of counterpart wheels rotatably mounted on a second shaft, each of said counterpart wheels each having a circumferential edge positioned closely adjacent to and in overlapping relationship to one of said cutting edges; a first pair of endless loop conveying belts, one of said first pair of endless loop conveying belts being aligned closely adjacent each of said counterpart wheels with the belt path of travel including a first plane substantially tangential to the circumference of the adjacent counterpart wheel; a second pair of endless loop conveying belts, one of said second pair of endless loop conveying belts being aligned closely adjacent each side of said cutting wheel with the belt path of travel including a second plane substantially parallel to said first plane, said second pair of endless loop belts being a least partially justaposed with said counterpart wheels; and means for compressing said sheet structure between said first and second pairs of endless loop belts in the region of said overlapping relationship between said cutting wheel and said counterpart wheels.

4,612,836

ADJUSTABLE SLICING MACHINE FOR BREAD AND OTHER TYPES OF FOODSTUFFS

Stefan Henn, and Norbert Flammann, both of Solingen, Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,366
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1983, 3341206
Int. Cl.[4] B26D *4/28*
U.S. Cl. 83—729 **19 Claims**



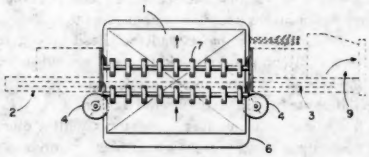
1. An appliance, particularly a household slicing machine, comprising a support; a knife mounted in said support for rotation in a first plane; a stop for the material to be sliced, said stop being located in a second plane which is at least substantially parallel to said first plane; and adjusting means mounted in part on said support and in part on said stop and arranged to move said stop in a direction transversely of said first plane, said adjusting means including a first component defining a helical path including a plurality of sections having different leads and a second component including a follower extending into said path so that, when one of said components is rotated relative to the other of said components, the extent to which said stop is moved relative to said first plane in response to rotation of said one component through a predetermined angle is determined by that section of the path which is being tracked by said follower.

4,612,837

APPARATUS FOR PRODUCING SLOPING PANELS

Florian Gendron, 7092 Levesque St., Anjou, Quebec, Canada H1K 2P7

Filed Jan. 31, 1983, Ser. No. 462,330
Claims priority, application Canada, Feb. 1, 1982, 395343
Int. Cl.[4] B26D *11/00*
U.S. Cl. 83—864 **11 Claims**



1. An apparatus for cutting roof panels, each roof panel having a top surface, a bottom surface, a first side surface, a

second side surface, and two end surfaces, said apparatus comprising:

a table;

means for adjusting said table according to a desired angle of cut of said roof panels;

engaging means for engaging said roof panels to bias said roof panels towards said table so that said roof panels are held between said table and said engaging means during a cutting operation;

circular saw means for cutting a groove in at least one of said side surfaces of each roof panel;

band saw means being located downstream from said circular saw means and being operable with said circular saw means for cutting each of said roof panels into at least a first portion including at least a part of said top surface, and a second portion including at least a part of said bottom surface; and

a cutting edge of said band saw means being in alignment with the plane of the groove cut by said circular saw means to sever each roof panel by said band saw means cutting through said groove cut in each roof panel by said circular saw means so that when the roof panels are passed by said table, said circular saw means, and said band saw means, the roof panels are cut at said desired angle.

4,612,838

ELECTRONIC MUSICAL INSTRUMENT

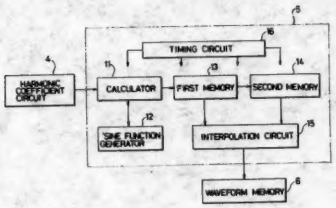
Yoichi Nagashima, Hamamatsu; Tatsunori Kondo, Shizuoka; Kiyomi Takauji, Hamamatsu; Mineo Kitamura, Hamamatsu; Tadashi Matsushima, Hamamatsu; Eiji Nagashima, Kami, and Masafumi Mizoguchi, Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 26, 1984, Ser. No. 665,124

Claims priority, application Japan, Oct. 27, 1983, 58-201665

Int. Cl.[4] G10H *1/08, 7/00*

U.S. Cl. 84—1.01 **3 Claims**



1. An electronic musical instrument of the type that forms a musical waveform by calculating the waveform amplitude value at each sample point thereof through Fourier synthesis, comprising:

a musical waveform generator for calculating and synthesizing a temporally varying musical waveform at a plurality of representative points of time;

a memory circuit for temporally storing only two musical waveform data which are calculated and synthesized by the musical waveform generator one after the ohter at successive points of time; and

an interpolation circuit for reading out the two musical waveform data from the memory circuit and calculating a plurality of waveform interpolation values corresponding to points on a time axis which are of shorter time intervals than the time intervals of the plurality of representative points of time;

wherein the musical waveform is effectively varied temporally with a small amount of waveform synthesis calculation per unit time.

4,612,839

WAVEFORM DATA GENERATING SYSTEM

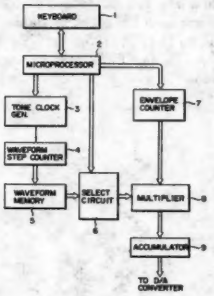
Takuya Sunada, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 578,834, Feb. 10, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 820,816

Claims priority, application Japan, Feb. 21, 1983, 58-26328

Int. Cl.[4] G10H *1/08, 7/00*

U.S. Cl. 84—1.01 **16 Claims**



6. A waveform data generating system, comprising:

memory means for storing at least two types of waveform data, wherein periods of said at least two types of waveform are respectively divided into different numbers of steps which are assigned to different addresses;

inputting means for inputting musical tone data; and

address signal generating means for generating an address signal to designate an address of the memory means at a rate as given according to the input musical tone data entered by said inputting means for selectively obtaining one of the at least two types of waveform data from the memory means in a predetermined address range of one period of a mixed waveform data to be formed and obtaining the other waveform data in the remaining address range thereof, so as to produce a mixed waveform data.

4,612,840

MUSICAL INSTRUMENT WITH A PLURALITY OF STRINGS

Fred W. Gretsch; Roy D. Cook, both of Ridgeland, S.C., and Bobby C. Iler, Brooklet, Ga., assignors to Fred W. Gretsch Enterprises, Ltd., Ridgeland, S.C.

Filed Oct. 19, 1983, Ser. No. 543,305

Int. Cl.[4] G10D *1/10, 3/12, 3/14*

U.S. Cl. 84—269 **17 Claims**

1. In a musical instrument having a body including a bottom, a neck, a headpiece, a plurality of strings and a head membrane, the combination comprising:

(a) a membrane retaining means to which said membrane is secured,

(b) head rim means fitting over said membrane retaining means and engaging said membrane retaining means, said head rim means including a plurality of slot means,

(c) a plurality of adjustable tuning means having upper and lower portions, said tuning means being held in place against side to side movement by corresponding ones of said slot means releasably engaging said upper portion of said tuning means, said plurality of adjustable tuning

means functioning to adjust said head membrane from the bottom of said body, and

(d) adjustable tailpiece means constructed to allow side to side movement to provide easy proper alignment of said strings.

4,612,841

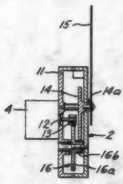
ELECTRONIC METRONOME

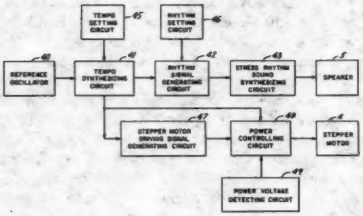
Haruzo Yoshikawa, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,636

Int. Cl.[4] G10B *15/00*

U.S. Cl. 84—484 **8 Claims**





1. An electronic metronome comprising: a tempo synthesizing circuit for receiving the output signal from a reference oscillator; a rhythm signal generating circuit for receiving the output signal from said tempo synthesizing circuit; a speaker for generating a sound in response to the output from said rhythm signal generating circuit through a stress rhythm sound synthesizing circuit; a stepper motor driving signal generating circuit for receiving the output from said tempo synthesizing circuit; a stepper motor connected to be driven by said stepper motor driving signal generating circuit; and a reduction gear assembly equipped with a baton and connected to be driven by said stepper motor; so as to reciprocatingly drive said baton.

4,612,842

APPARATUS FOR CUTTING FILAMENTARY MATERIAL

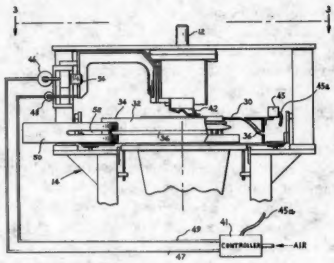
Donald F. Miller, Hendersonville, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 14, 1985, Ser. No. 765,521

Int. Cl.[4] D01G *1/04*

U.S. Cl. 83—24 **5 Claims**

5. A method for continuously cutting tow into predetermined lengths comprising the steps of: (a) feeding one end of a first tow into the cutter reel of a staple cutter for cutting the tow into predetermined lengths; (b) supplying one end of a second tow adjacent to the other end of said first tow; (c) tying said one end of said second tow and said other end of said first tow into a knot; (d) excluding said knot from said cutter reel while allowing said one end of said second tow to become wrapped on said cutter reel; (e) cutting said other end of said first tow and said one end of said second tow by means of said



cutter reel; (f) removing said knot; and (g) repeating steps (a) through (f).

4,612,843

DUAL AMMUNITION FEED FOR AUTOMATIC WEAPONS

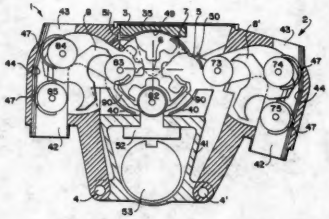
Joël Marcon; Jacques Durant, both of Bourges; Georges Simon, Saint Germain Du Puy, and Alain Boisseau, Bourges, all of France, assignors to Etat Francais, Paris, France

Filed May 30, 1984, Ser. No. 615,262

Claims priority, application France, Jun. 3, 1983, 83 09920

Int. Cl.[4] F41D *10/32*

U.S. Cl. 89—33.04 **16 Claims**



1. A dual feed device for a weapon comprising:

an external motor;

a rectilinearly shifting breech;

a positioning device for ammunition that includes a central positioning sprocket unit (7) and two feed casings (1, 2) loaded with various ammunition placed on either side of the central positioning sprocket unit and connected to one another by a common support (3), both casings being tiltable around axes (4, 4') that are parallel to the lengthwise axis of the weapon;

the device being further characterized in that each feed casing includes a unit (5, 5') of feed sprockets (8, 8'), and in that each casing is able, by tilting, to be coupled with the positioning device by coupling the feed sprocket unit of said each casing onto a reducing transmission (9), the coupling of one feed casing being followed by the simultaneous uncoupling of the other feed casing from the positioning device by uncoupling the feed sprocket unit of said other feed casing from the reducing transmission; and

the device being further characterized in that the tilt of the casings causes a change in rotational direction of the central positioning sprocket unit.

4,612,844

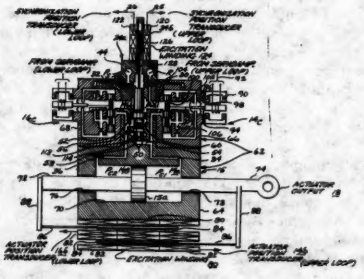
FAIL-PASSIVE ACTUATOR CONTROL

Frank Byford, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 7, 1985, Ser. No. 699,392

Int. Cl.[4] F15B *9/09*

U.S. Cl. 91—363 A **18 Claims**



1. An actuator control comprising:

signal input means for receiving an actuator command;

pressurized fluid supply means adapted to be coupled to a source of fluid under pressure Ps;

actuator means having first and second ports and having controlled bidirectional output in response to a fluid selectively applied to and returned from said first and second ports at pressures Pc1 and Pc2, respectively;

first and second unbalanced fluid control means each including feedback arranged with said actuator means and signal input means in a combined balanced configuration coupled to said first and second ports of said actuator means for bidirectional control of said output in response to an actuator command received at said signal input means; and,

synchronization control means coupled to said first and second fluid control means and said pressurized fluid supply for synchronizing operation of said first and second fluid control means when the sum of the pressures Pc1 and Pc2 existing at said first and second ports, respectively, of said actuator means, bear a predetermined relationship to the pressure Ps of fluid at said supply means, and for sensing a failure condition when said sum of the pressures Pc1 and Pc2 does not bear said predetermined relationship to the pressure Ps and responsively causing said first and second fluid control means to assume operating modes in which the pressures Pc1 and Pc2 are equalized.

4,612,845

ELECTROMAGNETICALLY OPERATED DUAL-VALVE FLOW-CONTROL ASSEMBLY

Rainer Burkel, Asperg, and Peter Zieher, Eberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,907

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1984, 3402118

Int. Cl.[4] F15B *13/044*

U.S. Cl. 91—448 **11 Claims**

1. A valve assembly for controlling fluid flow between a fluid source and a load, the assembly comprising:

an intake valve having

a valve body displaceable between a closed position preventing flow through the intake valve and an open position permitting such flow, and

a electromagnet electrically energizable to move the valve body between its positions;

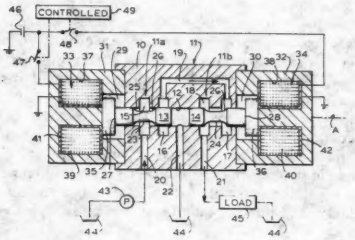
an output valve having

a valve body movable independently of the valve body of the intake valve and displaceable between a closed position preventing flow through the output valve and an open position permitting such flow, and

an electromagnet independent of the electromagnet of the intake valve and energizable to move the valve body of the output valve between its positions;

conduit means for connecting the valves in series between the load and the source, whereby fluid can only flow between the load and source when both of the valves are in their open positions;

biasing means including respective permanent magnets carried on the intake and output valve bodies adjacent the respective electromagnets and respective magnetically attractable elements on the valves for urging one of the valves into its open position and for urging the other valve into its closed position;



actuating means for electrically energizing the respective electromagnets to repel the respective permanent magnet and displace the valve body of the one valve into its closed position and the valve body of the other valve into its closed position; and

control means for permitting flow for a limited period of time between the source and the load by first energizing the electromagnet of the normally closed other valve and thereby permitting flow through both valves, for thereafter energizing the electromagnet of the one normally open valve to close same, for thereafter deenergizing the electromagnet of the other normally closed valve to close same, and for thereafter deenergizing the electromagnet of the one normally open valve to open same.

4,612,846

HIGH PRESSURE HYDRAULIC DISTRIBUTOR HAVING A MECHANICALLY CONTROLLED DISCHARGE VALVE

Clifford J. Balmer, St. Germain-en-Laye, and Richard Goddard, Senlis, both of France, assignors to Vickers Systems S.A., Saint-Quen l'Aumone, France

Filed Feb. 12, 1985, Ser. No. 700,624

Claims priority, application France, Feb. 22, 1984, 84 02669

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—457 **18 Claims**

1. In a hydraulic distributor of the type comprising:

a body comprising a first inlet duct having connection means to a source of hydraulic fluid under pressure, a first outlet duct having connection means to utilisation means of such fluid, means forming a second entry duct having connection means to the utilisation means, a second outlet duct having connection means to a fluid reservoir,

first distributor means positioned between said first inlet duct and said first outlet duct inside said body for, at will, establishing a fluid feed circuit from said inlet duct to said first outlet duct or closing said circuit,

second distributor means, positioned between said means forming said second inlet duct and said second outlet duct inside said body, for, at will, establishing a fluid return circuit from said means forming said second inlet duct towards said second outlet duct or closing said circuit,

control meansuof said first and second distributor means for, at will, establishing one of said circuits whilst closing the other or closing said two circuits simultaneously,

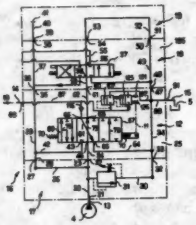
said second distributor means comprise:

a return duct arranged in said body in a predetermined direction, said return duct, on the one hand, opens into said second outlet duct, and, on the other hand, has a communication zone with said means forming said second entry duct and has a closed end opposite said second outlet duct with respect to said communication zone,

a non-return valve positioned in said first outlet duct between said connection means to said utilisation means and said first distributor means, said valve being elastically urged to its closed position in a direction from said means connecting to said utilisation means towards said first distributor means,

a piston slidingly mounted along said direction in said return duct, in said communication zone and on both sides of it, said piston having respective end zones between said zone and said second outlet duct and between this zone and said end of said return duct said end zone positioned between said communication zone and said second outlet duct having transversely to said direction a cross-section less than that of the said end zone positioned between said communication zone and said end of said return duct,

abutment means arranged complementarily on said piston and in said return duct, between said communication zone and said second outlet duct, said piston having between said corresponding abutment means and said end posi-



tioned between said communication zone and said end of said return duct a length less than that which said return duct has between its said end and said corresponding abutment means, said abutment means defining jointly a fluid-tight abutment of said piston with respect to said return duct in a direction from said end of the latter towards the second outlet duct,

fluid-tight sliding contact means between said piston and said return duct between said communication zone and said end of said return duct,

a chamber limited jointly by said piston and said return duct, between said end of it and said fluid-tight sliding contact means,

a first calibrated passage opening at one end into said means forming said second inlet duct, between said communication zone and said means connecting said means forming said second inlet duct to said utilisation means, and the other end into said chamber,

a second calibrated passage, arranged in said piston in said direction and opening at one end into said chamber and at said other end into said end zone of said piston positioned between said communication zone and said second outlet duct, said second calibrated passage having a cross-section greater than that of said first calibrated passage,

a needle arranged in said chamber opposite said second calibrated passage in said direction,

a fluid-tight seat for said needle, arranged in said piston about said second calibrated passage and constituting an abutment for said needle, with respect to said piston, in a direction leading from said chamber towards said second outlet duct in said direction,

resilient means urging said needle towards said fluid-tight seat,

control means translating a control in the direction of establishing the return circuit by a movement of said needle in the direction of a separation with respect to said fluid-tight seat, and a command in the direction of closing said two circuits or in the direction of establishing said feed circuit by free application of said needle on to said fluid-tight seat under the action of said resilient means, the improvement comprising:

said means forming said second inlet duct being constituted by said first outlet duct, of which said connection means to said utilisation means constitute said connection means of said means forming second entry duct to said utilisation means;

said communication zone of the said return duct with said means forming said second inlet duct being constituted by an intersection zone of said return duct with said first outlet duct, situated between said connection means to said utilisation means and said non-return valve;

a passage forming an integral part of said first outlet duct being limited jointly by said piston and said return duct in said intersection zone, between said abutment means, situated between said intersection zone and said second outlet duct, and said fluid-tight sliding contact means, situated between said intersection zone and said closed end of said return duct.

4,612,847

VACUUM CONTROL DEVICE FOR THE DISPLACEMENT OF AN ELEMENT BETWEEN AT LEAST THREE POSITIONS

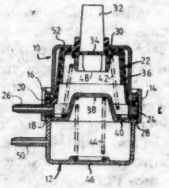
Jean-Francois Bouvot, Dampierre, and José LeBorgne, Trappes, both of France, assignors to Valeo, Paris, France

Filed Jun. 1, 1984, Ser. No. 616,476

Claims priority, application France, Jun. 3, 1983, 83 09301

Int. Cl.[4] F01B *31/14*

U.S. Cl. 92—13.1 **8 Claims**



1. A vacuum control device for the displacement of an element between at least three positions, comprising a casing in which are disposed at least two spaced substantially parallel movable cups, said casing having a bottom end-wall, the first cup being connected to the element to be displaced, said second cup being spaced from said bottom end-wall, springs interposed respectively between the two cups and between the second cup and said bottom end-wall of the casing, and two fluid communication means adapted to be connected to a vacuum source and to atmospheric air and opening into the casing respectively within the space located between the two cups and within the space located between the second cup and the bottom end-wall of the casing, a deformable flexible diaphragm carrying said first cup and having a periphery attached to the casing and providing a leak-tight division of the internal space of said casing said second cup being mounted within the casing with a clearance and in a non-leaktight manner for movement toward and away from said end-wall, said casing including a fixed portion remote from said bottom end-wall, the associated spring resiliently biasing said second cup into sealing engagement against said fixed portion, thereby dividing the internal

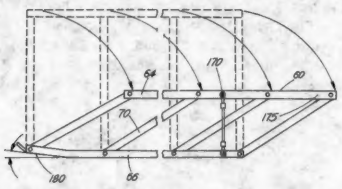
space of the casing into two space chambers which are separated in leak-tight manner the two space chambers communicating with each other upon movement of the second cup away from said fixed portion.

4,612,848

METHOD AND APPARATUS FOR MOVING AIR ACROSS A MINERAL FACE

Frank Pollack, Clarksburg, Pa., assignor to Advanced Air Systems, Clarksburg, Pa.

Filed Jun. 7, 1985, Ser. No. 742,697
Int. Cl.[4] E21F *17/12*
U.S. Cl. 98—50 **15 Claims**



1. A collapsible, expansible frame and canvas arrangement which comprises:

a. a frame, said frame having a front end for movement towards a mine face;

b. a rear end for controlling movement of said front end towards said mine face and;

c. an upper canvas support means extending between said front and rear ends of said frame

d. lower canvas support means on said frame

e. support members pivotally connected between said upper and lower support means so that said frame has a collapsed configuration and an expanded configuration

f. abutment surfaces on said frame for abutment with a mine floor and a mine roof

g. expansible means on said frame urging said upper canvas support means from a collapsed position into a spaced apart relationship with said lower canvas support and said abutment surfaces into engagement with the mine floor and roof when said frame is in the expanded position and;

h. means for holding said frame in a collapsed configuration

i. canvas means connected between said upper support and said lower support so as to direct air flow from one end of said frame to the other when in an expanded configuration.

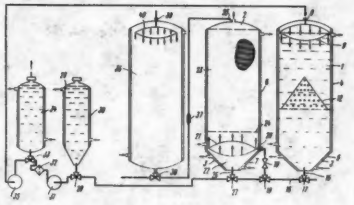
4,612,849

APPARATUS FOR CHAMPAGNIZATION OF WINE IN A CONTINUOUS FLOW

Alexandr I. Konischev, Rostov-na-Donu; Vasily P. Arestov, Novocherkassk; Vasily I. Baburin, and Ljudmila P. Ilchenko, both of Rostov-na-Donu, all of U.S.S.R., assignors to Vserossiisky Nauchnoissledovatelsky Institut Vinogradarstva I Vinodelia Imeni Ya.I. Potapenko, Novacherkassk, U.S.S.R.

Filed Mar. 6, 1984, Ser. No. 586,793
Int. Cl.[4] C12G *1/02*
U.S. Cl. 99—277.1 **5 Claims**

1. An apparatus for champagnization of wine in a continuous flow, comprising: a vertical tightened reservoir for fermentation, a lower portion thereof is conical; a pipe for feeding a fermentation mixture to said reservoir; a pipe for discharging wine being champagnized from said first reservoir, arranged in a lower part thereof; a second vertical tightened reservoir for biogeneration communicating with said first reservoir, a lower power whereof is conical; temperature-controlling jackets for each reservoir; a pipe for introducing the wine being champagnized from said first reservoir into said second reservoir; packings arranged in an upper part of said second reservoir at a height of about ⅓ of said second reservoir; an outlet pipe for discharging champagnized wine from said second reservoir; an accumulator-and-cooler communicating with said outlet pipe of said second reservoir; a device for uniform spreading of liquid throughout the volume of said first reservoir, arranged on said inlet pipe of said reservoir in an upper part thereof; a



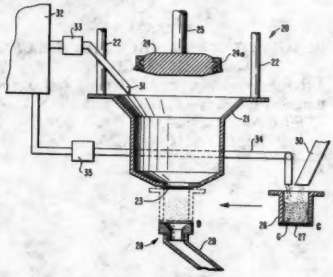
device for uniform spreading of liquid throughout the volume of said second reservoir, arranged on said inlet pipe of said second reservoir above said conical lower portion thereof, wherein in said lower conical portion of said second reservoir a zone for sediment accumulation is provided, said devices for uniform spreading of liquid comprising perforated pipes extending along a perimeter of each of said reservoirs.

4,612,850

BREWING APPARATUS

Takeshi Kanazashi, Kiriu, and Toru Kanbe, Ota, both of Japan, assignors to Sanden Corporation, Isesaki, Japan

Filed Apr. 11, 1985, Ser. No. 721,939
Claims priority, application Japan, Apr. 16, 1984, 59-56367[U]; Jul. 30, 1984, 59-117072[U]; Aug. 30, 1984, 59-130531[U]
Int. Cl.[4] A47J *31/34*
U.S. Cl. 99—289 R **6 Claims**



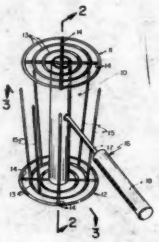
1. In a brewing apparatus including a vertically movable cylinder having an open top and open bottom, a piston mounted for reciprocation down into said cylinder, brewing liquid supply means having a discharge opening positioned to discharge brewing liquid into the open top of said cylinder, a liquid heating tank connected with said liquid supply means, a brewing cavity reciprocable horizontally between a brewing position and a rest position, said cavity being tightly engaged with the open bottom of said cylinder when disposed in said brewing position, and ground beverage material supply means having a delivery opening positioned to supply ground material into said brewing cavity when said cavity is disposed at a material supplying position, the improvement comprising second liquid supply means including a liquid supply duct having a discharge opening positioned to discharge liquid into said brewing cavity when said cavity is disposed at said material supplying position, said liquid supplying duct being connected

with said liquid heating tank, and an electromagnetic valve in said duct to control the liquid supply operation of said second liquid supply means.

4,612,851
COOKING UTENSIL

Bernard T. McManus, Suite 311, U.S. Federal Bldg., Lander, Wyo. 82520

Filed Jun. 7, 1985, Ser. No. 742,313
Int. Cl.[4] A47J *43/18*
U.S. Cl. 99—419 **6 Claims**

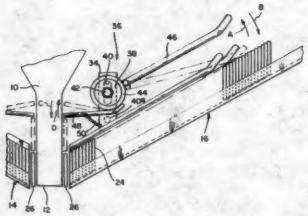


1. A cooking utensil comprising:
(a) an elongated body having opposite ends;
(b) a first base attached to one end of the body being capable of supporting the body in a vertical position;
(c) a second base attached to the other end of the body being capable of supporting the body in a vertical position;
(d) a plurality of impaling pins, the ends of the pins being attached to either the first base or second base and being positioned substantially in the direction of the elongated axis of the body; and
(e) a handle means associated with the body, bases and pins for maneuvering and inverting the cooking utensil.

4,612,852
WAFER AGITATOR ASSEMBLY FOR ICE CREAM SANDWICH MACHINE

Floyd W. Price, Freehold, N.J., and Richard Vest, Lenoir City, Tenn., assignors to Burry-Lu, Inc., Elizabeth, N.J.

Filed Nov. 23, 1984, Ser. No. 674,202
Int. Cl.[4] A21C *9/04, 15/00*
U.S. Cl. 99—450.4 **9 Claims**

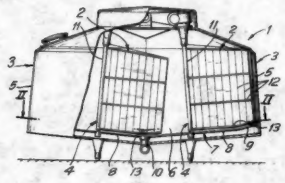


1. In an ice cream sandwich machine of the type including a nozzle having a discharge end from which ice cream is extruded, a wafer infeed and delivery assembly associated with said nozzle comprising a pair of wafer trays for feeding wafers against opposite sides of said extruded ice cream and paired, vertically reciprocable wafer pusher blade means cooperating therewith, and an index wheel positioned below said nozzle and having a plurality of pockets therein for receiving said wafers and said ice cream in the form of a sandwich, wafer agitator means communicating with said wafer pusher blade means comprising:
wafer impact means positioned above said wafers in said wafer trays for inhibiting sticking of adjacent wafers to each other by periodically impacting upper surfaces of said wafers when the latter are aligned in said wafer trays; and
control means for controlling said wafer agitator means to periodically impact said upper surfaces of said wafers in said wafer trays.

4,612,853
CHEESE KETTLE

Lauri Kostiainen, and Heikki Kauppi, both of Helsinki, Finland, assignors to MKT-Tehtaat Oy, Helsinki, Finland

Filed May 28, 1985, Ser. No. 738,684
Claims priority, application Finland, May 28, 1985, 842133
Int. Cl.[4] A01J *13/00, 25/00*
U.S. Cl. 99—461 **8 Claims**

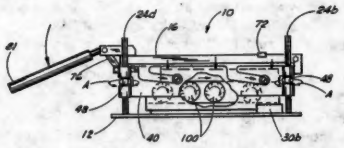


1. A cheese kettle comprising two substantially cylindrical parts each having an upwardly extending central axis, an upwardly extending mantle disposed concentrically about said central axis, said mantle forming the upwardly extending sides of said kettle and being in the form of circular arcs transversely of the central axis, and a bottom extending in a plane perpendicularly of the central axis and extending outwardly toward said sides, a rotary tool located in each of said cylindrical parts for treating the cheese mix, said tools being shaped so that during rotation the tool follows along the bottom and sides of the kettle for affording complete treatment of the cheese mix, the central axes of said cylindrical parts being inclined relative to the vertical toward one another in the direction upwardly from the bottoms thereof with said central axes disposed in spaced relation so that said mantles intersect along two oppositely disposed upwardly extending lines.

4,612,854
NUTCRACKER APPARATUS

Henry J. Chiro, 32161 Pea Ridge Rd., Albany, La. 70711

Filed May 24, 1984, Ser. No. 613,625
Int. Cl.[4] A23N *5/00*
U.S. Cl. 99—579 **9 Claims**



1. A nutcracker apparatus, comprising:
a. a base;
b. a lower cracking plate removably positioned on said base;
c. a lower frame connected to said base, comprising:
i. a threaded stud rigidly attached adjacent each corner of said base and extending upwardly therefrom; and

ii. a pair of slotted side rails adapted to threadably engage at least two of said studs in parallel relation to each other for vertical adjustment of said side rails on said studs relative to said base and adapted to pivotally receive said upper frame;

d. an upper frame pivotally engaged at its forward end to said side rails, said upper frame movable between a first inoperative position and a second operative position;

e. an upper cracking plate slidably engaged with said upper frame, movable between a first inoperative position and a second operative position; and

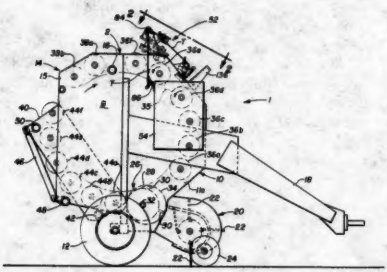
f. means for moving said upper cracking plate between said first and said second positions.

4,612,855

TWINE WRAPPING APPARATUS WITH STATIONARY TWINE GUIDE MEMBER

Robert A. Wagstaff, Lancaster, and Emmett F. Glass, Akron, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Oct. 16, 1985, Ser. No. 787,955
Int. Cl.[4] B65B *13/18*
U.S. Cl. 100—5 **9 Claims**



1. In a roll baling machine having a frame, a plurality of conveying members extending transversely of said frame for forming crop material into roll bales, and apparatus for wrapping the roll bales with twine, said apparatus comprising:

a twine dispensing member mounted on said frame for pivoting movement to dispense twine through a gap between two of the conveying members; and

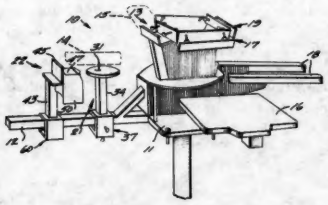
stationary guide means extending transversely of said frame for guiding the twine into said gap during the pivoting movement of said twine dispensing member.

4,612,856

PAINTER'S CAP PRINTING

Roger Jennings, 1 Apple La., Glens Falls, N.Y. 12801

Filed Nov. 3, 1983, Ser. No. 548,343
Int. Cl.[4] B41F *17/00*
U.S. Cl. 101—129 **9 Claims**



1. A method of imprinting the top of a completed first painter's cap, which has a generally oval top, a bill, a sweatband, a front, and a hem between the front and top, the top having generally the same area as a head-receiving opening at the sweatband; and utilizing a flat platen having a configuration generally corresponding to the configuration of the painter's cap top, and utilizing a silk screen; said method comprising the steps of:

(a) mounting a painter's cap on the flat platen so that the platen is interior of the painter's cap and engages the bottom of the top portion of the painter's cap;

(b) affixing the painter's cap with respect to the platen so that the top of the painter's cap is essentially smooth and in contact with the platen so that there is essentially no relative movement between the cap top and the platen;

(c) bringing the silk screen into contact with the top of the painter's cap while mounted on the platen to thereby print indicia onto the top of the painter's cap;

(d) removing the painter's cap from the platen after printing; and

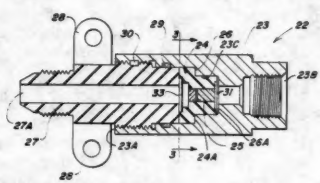
(e) at generally the same time as practicing steps (a)–(c), printing the front panel of a second cap, including practicing step (c) to simultaneously bring the silk screen into contact with the first cap top, and with the second cap front while the second cap front is supported by a saddle having a flat printing surface.

4,612,857

BALLISTIC GAS FIRED DEVICE

Morry L. Schimmel, University City, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jul. 16, 1984, Ser. No. 631,145
Int. Cl.[4] F42C *19/00, 19/08*
U.S. Cl. 102—204 **10 Claims**



1. In a hot ballistic gas fired device, the improvement comprising:

(a) a housing having opposite spaced inlet and outlet ends and an intervening cavity between said inlet and outlet ends, said cavity being defined by an internal shoulder facing said inlet end;

(b) holder means in said housing cavity, said holder means having a surface thereon for abutment against said internal shoulder of said cavity;

(c) explosive train means carried by said holder means in operative position in said housing;

(d) seal means on said holder means, said seal means being positioned to face said housing inlet end and also being spaced from said explosive train means to provide a second cavity; and

(e) hot ballistic gas delivery means for said housing, said delivery means having an end in abutment with said holder means adjacent said seal means and having a passage therethrough for delivering hot ballistic gas directly against said seal means for causing rupture of said seal means and activation of said explosive train.

4,612,858
FUSE FOR A SATELLITE PROJECTILE

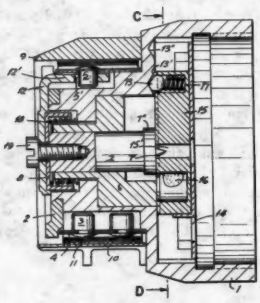
Guenter Backstein, Meerbusch, and Hans W. Unger, Krefeld, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,445

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1983, 3333312

Int. Cl.⁴ F42C *15/26*

U.S. Cl. 102—245 **9 Claims**



1. An improved fuse for a satellite projectile having a housing and a first ignition needle axially movably mounted in said housing, a wound band safety means operatively mounted in said housing, a detonator support having a main detonator charge laterally movably mounted relative to said first ignition needle, said detonator support being movable from a safety position to an armed position due to the action of a centrifugal force caused by the spin of said satellite projectile, the improvement comprising,

a key-shaped cover having a first transverse wall portion and a second peripheral wall portion and being movably mounted in said fuse relative to said housing;

said ignition needle being centrally mounted in said housing and being connected to said key-shaped cover;

said key-shaped cover having at least one first recess in said second peripheral wall portion;

a sheet metal spring being fixedly mounted on said housing and having a free end;

at least one locking pin being secured to said sheet metal spring and extending into said first recess of said key-shaped cover, the free end of said sheet metal spring swinging radially outwardly under the influence of centrifugal forces caused by the spin of the projectile,

and including a first coil spring coaxially mounted about at least a portion of said hollow cylinder; one end of said coil spring contacting said housing and the other end of said coil spring biasing said ignition needle away from said support member whereby said locking pin is moved out of said first recess by said first coil spring a defined axial movement to release said ignition needle and key-shaped cover.

4,612,859
MULTIPLE PURPOSE WARHEAD

Benjamin Furch, Unterlüss, and Jens Seidensticker, Kaarst, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,649

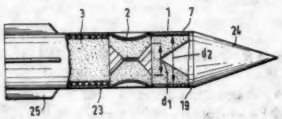
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336853

Int. Cl.⁴ F42B *11/22*

U.S. Cl. 102—476 **4 Claims**

1. An improved multiple purpose warhead having at least three combat-effective cylindrically shaped portions of equal diameter arranged in axial alignment one behind the other in said warhead, each one of said portions including an explosive charge as well as a different type of cladding, the front-most first portion having a forwardly directed open spike-shaped cladding and a hollow charge, a second portion adjoins said first portion and has an outer layer as well as ignition means operatively connected to said explosive charges disposed in said three portions for simultaneously igniting them, the improvement comprising

said outer layer of the second portion has projectile forming characteristics, the explosive charge of said second portion has two symmetrical axially extending conical reces-



ses whose apices confront each other and whose bases confront the respective axial ends of said warhead, the diameter d_1 of said bases is smaller than the diameter d_2 of said explosive charges which are respectively operatively mounted in said first and third portions, whereby said difference in diameters $d_2 - d_1$ is such that upon detonation of the explosive charge in said second middle portion a ring-shaped simultaneous detonation of the explosive charges in said first and third portions is effected, and said conical recess in said second portion whose base confronts said first portion has an inert conical insert.

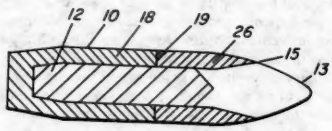
4,612,860
PROJECTILE

Abraham Flatau, 2004 Stockton Rd., Joppa, Md. 21085

Continuation of Ser. No. 627,142, Jul. 2, 1984, abandoned. This application Jun. 12, 1985, Ser. No. 743,879

Int. Cl.⁴ F42B *11/06*

U.S. Cl. 102—518 **1 Claim**



1. A composite projectile for use in the penetration of armor protected targets when fired from a gun bore consisting of:

an elongated cylindrical rigid hollow carrier having a closed aft end portion and an open forward portion provided with a first end,

said first end of said carrier provided with a sharp annular non-deformable leading edge of extreme harness,

said carrier having an outer diameter fitting in close uniform direct surface contact with said gun bore when said carrier is fired at a target,

said aft end portion of lightweight material, and said forward portion of denser material than said aft material,

an elongated cylindrical penetrator core of high density material for the penetration of armor when said core impacts said target,

said core carried in said hollow carrier,

said core having a cylindrical body provided with a forward conical end terminating in a point, and an aft end in separable contact with said aft end of said carrier on initial firing and then separating from said aft end of said carrier on impact with said target,

said core fitting in telescopically slidable relation within said carrier,

said core having a forward pointed end situated aft of said forward end of said carrier when said aft end of said core is in contact with said closed end of said carrier,

a thin-walled hollow fairing in the form of an ogive secured to said forward end of said carrier for the reduction of aerodynamic drag of said projectile during flight.

4,612,861

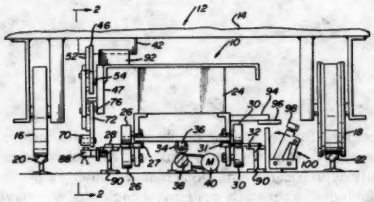
DRIVERLESS TUGGER VEHICLE

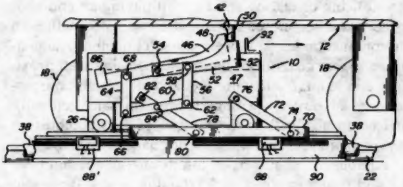
Per E. Lindquist, Easton, Pa., assignor to Si Handling Systems, Inc., Easton, Pa.

Filed Dec. 7, 1983, Ser. No. 559,123

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—166 13 Claims





1. A driverless tugger vehicle adapted to shuttle back and forth on a first path and pull another driverless vehicle supported for movement along a second path parallel to said first path each time it moves in a forward direction, said tugger vehicle including a body having support wheels, at least one drive wheel on said tugger vehicle, said drive wheel being adapted for frictional contact with a drive shaft separate from the tugger vehicle and positioned adjacent to the first path for propelling the tugger vehicle, contact means on the tugger vehicle adapted for selective engagement with another vehicle to propel the other vehicle along said second path when said tugger vehicle moves in a forward direction, a switch actuator supported by said body, said actuator being coupled to said contact means so as to activate a switch means to effectuate a reversal of the direction of travel of the tugger vehicle when said contact means engages another vehicle to be propelled by the tugger vehicle.

4,612,862

THREE LEVEL VEHICLE BODY FOR RAILCARS, WITH FORCE DISTRIBUTING TRIANGULAR SHAPED PLATES

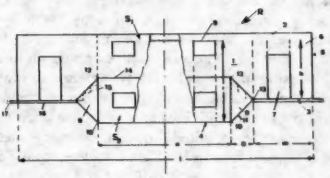
Jürg Zehnder, Uitikon, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 4, 1984, Ser. No. 596,646

Claims priority, application Switzerland, Apr. 19, 1983, 2088/83

Int. Cl.[4] B61D *17/00*

U.S. Cl. 105—340 7 Claims



1. A vehicle body for railcars having endwalls and sidewalls of hollow metal sections connecting a roof and a floor wherein said floor comprises a first intermediate floor consisting of two portions extending from the endwalls toward each other, a second lower floor connected to said two extending portions and a third upper floor over said second lower floor the improvement comprising a plurality of triangular shaped side plates connecting said second lower floor and said third upper floor to said two extending portions at the corners of said side plates to as to uniformly distribute longitudinal forces to said floor while preventing the transfer of longitudinal forces to said sidewalls.

4,612,863

WORK TABLE

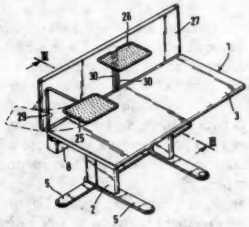
Robert Vonhausen, Giessen-Wieseck, and Rainer Machate, Biebertal, both of Fed. Rep. of Germany, assignors to VOKO Franz Vogt & Co., Pohlheim, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 543,186

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239371

Int. Cl.[4] A47B *17/00*; B25H *1/02*

U.S. Cl. 108—28 1 Claim



1. In a work table which includes a pedestal, a table top supported on said pedestal, and a rail which is disposed below said table top in a rear region of said table, which extends the entire width of said table, which is connected fixedly to said pedestal, and which is freely accessible, the improvement comprising wherein said rail is a multi-function rail which is hollow, the interior of said multi-function rail being accessible by means of a lid which is removably supported in an opening in said multi-function rail, wherein said multi-function rail has ends which are freely accessible and are adapted to receive fastening plates which can connect said multi-function rail to at

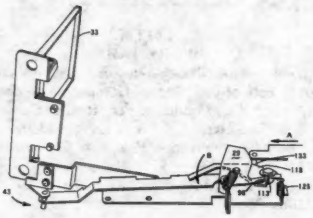
least one of an attachment and a further rail; wherein said multi-function rail includes means for dividing the interior thereof into several separate regions which each extend lengthwise thereof; wherein said pedestal includes means for vertically movably supporting said table top, said multi-function rail being fixedly connected to a portion of said pedestal which is stationary, and includes means supporting said table top for pivotal movement about a substantially horizontal axis; wherein at least one portion of said pedestal is hollow; wherein said multi-function rail includes two U-shaped profiles which are spaced and which each have legs which each project toward a leg on the other U-shaped profile, said U-shaped profiles being connected to one another by means which includes bolts extending therebetween; including fastening means for supporting an accessory part on said multi-function rail, said fastening means including two clamping jaws which can be positionally adjusted relative to one another and can securely grip one of said U-shaped profiles; including two supports which are mounted on said fastening means and which each support a respective accessory part; and wherein said supports are spaced rearwardly from a rear edge of said table top by different distances.

4,612,864

FASCIA PROTECTIVE DOOR MECHANISM

Robert J. Beck, and Jack Richardson, both of Stark County, Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Oct. 26, 1984, Ser. No. 664,903
Int. Cl.[4] E06B *9/00*
U.S. Cl. 109—49.5 **15 Claims**



1. Apparatus comprising a wall with an opening, said wall having an internal side and an external side wherein said apparatus selectively opens and closes the opening in the wall according to the position of a machine internally disposed of said wall which selectively occupies the opening, the machine being movable between an occupying condition wherein the machine occupies the opening and a non-occupying condition wherein the machine does not occupy the opening, said apparatus further comprising:

door means for closing the opening, said door means being mounted for movement between an open position uncovering the opening and a closed position closing the opening, said door means being fully disposed internally of said opening in the open position; and

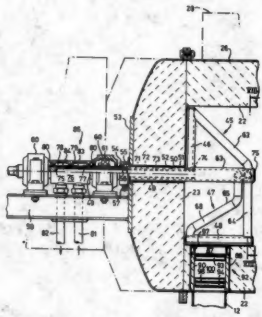
linkage means operatively connected to said door means for moving said door means to the open position in response to movement of the machine to the occupying condition and for moving said door means to the closed position in response to movement of the machine to the non-occupying condition; said linkage means including blocking means for preventing movement of said door means from the closed position to the open position when the machine is in the non-occupying condition.

4,612,865

APPARATUS FOR THE COMBUSTION OF SOLID FUELS

Jan-Ake I. Nilsson, Bjärred, and Bengt L. Hansson, Löddekö pinge, both of Sweden, assignors to Rippelton N.V., Curacao, Netherlands Antilles

Filed Jul. 12, 1985, Ser. No. 754,425
Claims priority, application Sweden, Jul. 26, 1984, 8403865
Int. Cl.[4] F23G *5/06*
U.S. Cl. 110—244 **11 Claims**



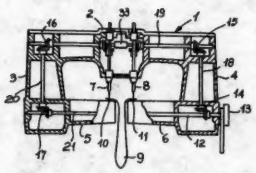
1. A cyclone furnace for the combustion of solid fuels with air to form ash or slag or gases or mixtures thereof comprising a generally cylindrical combustion chamber, having a horizontal axis, including a generally cylindrical enclosing wall having an inner surface, a first end and a second end, said first end spaced apart from said second end along said horizontal axis, said first end being closed by an end wall having an end wall inner surface, said second end being open so as to define an outlet for combustion gases; at least one inlet opening, tangentially formed in said generally cylindrical enclosing wall proximate said second end, for feeding fuel and air to said combustion chamber; an outlet opening, formed in said generally cylindrical enclosing wall at the bottom of said combustion chamber proximate said end wall, for discharging ash and slag from said combustion chamber; an ash discharge conduit connected to said outlet opening and extending away from said combustion chamber; scraping means, disposed within said combustion chamber, for scraping loose ash and slag from said end wall inner surface and from at least a portion of the inner surface of said generally cylindrical enclosing wall adjacent said end wall; an ash discharge sluice comprising a first ash hatch provided in said ash discharge conduit, a second ash hatch provided in said ash discharge conduit, and a control means for opening and closing said first and second ash hatches, said first hatch being located in said discharge conduit a first predetermined distance away from said combustion chamber so as to form an ash collecting space of a first predetermined volume between said inner surface of said cylindrical enclosing wall and said first hatch wherein ash and slag may be collected by said scraping means; said second hatch being located in said discharge conduit a second predetermined distance away from said combustion chamber, said second predetermined distance being greater than said first predetermined distance so as to form a sluice chamber of a second predetermined volume, said second predetermined volume being greater than said first predetermined volume.

4,612,866

SEWING MACHINE WITH A BRIDGE-TYPE STRUCTURE

Roberto Sanvito, Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Italy

Filed Mar. 29, 1985, Ser. No. 717,614
Claims priority, application Italy, Jun. 15, 1984, 22312/84[U]
Int. Cl.[4] D05B *25/00*
U.S. Cl. 112—155 1 Claim



1. A sewing machine with a bridge-type structure, provided with a top section carrying two needle rods which are located at a distance from each other and operated by a single two piece shaft located within the top section and with two opposite bottom sections which are located at a distance from each other and contain the lower sewing elements which cooperate with the said needle rods in order to form the stitches, the said top section, in the zone lying between the needle rods, being divided into two parts provided with adjusting means designed to enable one part to slide relative to the other and designed to fix the said parts in the required position with consequent variation in the distance between the needle rods and the bottom sections, wherein said shaft is provided with coaxial, mating connecting means consisting of a grooved area defining teeth on the outside of one of said two shaft pieces and of a grooved area defining teeth on the inside of the other one, such that said two grooved pieces enable the length of the shaft itself to be varied when the distance between the needle rods is varied, and wherein one tooth of said outer grooved piece is larger than the other teeth and is designed to engage in a correspondingly sized groove of said inner grooved piece in a position such that the angular position of the two pieces forming the single two piece shaft remains unvaried.

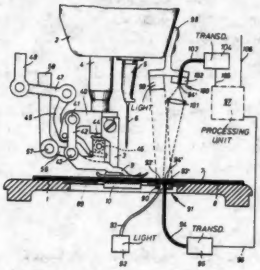
4,612,867

METHOD AND APPARATUS FOR THE PATTERN-CORRECT SEWING TOGETHER OF CLOTH PARTS

Joachim Rösch, Enkenbach-Alsenborn; Heribert Geisselmann, Stutensee, and Richard Wagner, Karlsruhe, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,405
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346163
Int. Cl.[4] D05B *27/06, 27/08*
U.S. Cl. 112—314 15 Claims

1. A method for the pattern-correct sewing together of two cloth pieces each having structure that defines the same pattern, by a sewing machine with one cloth feed means arranged over and one cloth feed means arranged under the cloth pieces, a relative feed amount of the feed means being variable by at least one positioning system, and with a sensor for sensing the structure of the pattern arranged upstream of a stitch-forming point for each cloth piece in a cloth feed direction and with a signal processing unit which processes signals from the sensors corresponding to a relative position of the patterns on the cloth pieces and which influences the positioning system for the feed means in accordance with the established relative position of the structure of the patterns of the cloth pieces, characterized in that the pattern structure of each cloth piece (7,8) is continuously determined by the sensors (91,100) by measuring values of the structure of the pattern at a measured region for each cloth piece, that the values determined are supplied as signals to the signal processing unit (97), that the signals, taken from the two cloth pieces (7,8) within the same predetermined length of said measured regions upstream of the stitch-forming joint, of both sensors (91,100) are stored independently of each



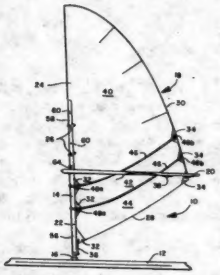
other in the signal processing unit (97) as signal sequences, and that the signal processing unit (97) determines a momentary difference of position between the structures of the patterns of the two cloth pieces (7,8) from the signal sequences by calculation of their degree of overlap and controls the positioning system (80) as a function of the found offset.

4,612,868

SAIL SYSTEM WITH ADJUSTABLE SAIL AREA

Randall H. Reynolds, 506 35th St., Newport Beach, Calif. 92663

Filed Dec. 13, 1983, Ser. No. 561,040
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—39 9 Claims



1. A sail, mast and boom for a wind-driven craft, comprising:
a mast;
a boom attached to the intermediate portion of the mast;
an upper sail section having a luff securable adjacent the mast, a leech extended distally from the mast, a foot at the bottom thereof extending between said luff and said leech, a tack at the juncture between said luff and said foot and a clew at the juncture between said leech and said foot;
a lower sail section having a luff securable adjacent the mast, a leech extended distally from the mast, a foot at the bottom thereof extending between the luff and the leech, a tack at the juncture between the luff and the foot, and a clew at the juncture between the leech and the foot;
readily removable attachment means to continuously seam the upper edge of said lower sail section to the lower edge of said upper sail section from said tacks to said clews;
means for adjusting the height of the mast between a first extended height when the lower sail section is attached to the upper sail section and a second height when the lower

sail section is removed from the upper sail section, said second height being lower than said first height by an amount approximately equal to the length of the luff edge of said lower sail section; and

with the free end of the boom being secured to the clew of the lower sail section when the lower sail section is attached to the upper sail section and with the free end of the boom being secured to the clew of the upper sail section when the lower sail section is removed from the upper sail section, and also with the tack of the lower sail section being downhauled adjacent the lower portion of the mast when the lower sail section is attached to the upper sail section and the tack of the upper sail section being downhauled to the lower portion of the mast when the lower sail section is removed from the upper sail section.

4,612,869

ANCHOR SYSTEM

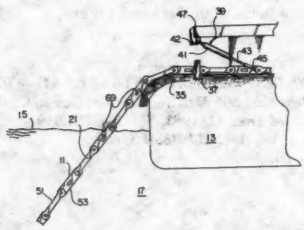
Horst Poppe, Hamburg, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Jan. 3, 1984, Ser. No. 567,460

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248748

Int. Cl.[4] B63B *21/50*

U.S. Cl. 114—293 **12 Claims**



1. An anchor system for anchoring a floating structure in deep waters, comprising: an anchor line extending from said floating structure to an anchor ground, said anchor line having a first section proximate said floating structure, a second section proximate said anchor ground and an intermediate section thereinbetween; wherein said anchor line first section comprises an anchor chain assembly having a plurality of single link members having bores at each end thereof and a plurality of double link members also having bores at each end thereof to match said single link member bores in said chain assembly, said bores having internal surfaces; said single link members and said double link members being alternately disposed adjacent to one another in said chain assembly; said anchor chain assembly including transverse bolt means operatively associated in assembly with said bores of said single link members and said double link members to pivotably secure said adjacent link members together to form a chain; said transverse bolt means having a shank portion, said shank portion having a surface which directly bears on said internal bore surfaces in said link members, wherein said anchor line intermediate section comprises a sinker cable having a plurality of interconnected weights associated therewith, and wherein said anchor line first section includes means for sealing said shank surface to prevent water ingress to said shank surface, wherein further each said single link member comprises an elongated member with said bores being disposed proximate each end thereof, said elongated member including opposed sides having a circumferentially disposed groove formed about each of said bores on both said opposed sides, and wherein each said double link member comprises a pair of elongated members with said bores at each end of said pair of elongated members being disposed proximate each other, said pair of elongated members being held in a spaced relation by said single link members disposed thereinbetween, said double link members including a pair of facing sides having a circumferentially disposed groove formed about each said bore, said anchor chain assembly including circumferential gasket seats which are defined and formed by said circumferentially disposed grooves, said means for sealing further comprising "O"-ring gasket means disposed in said circumferential gasket seats.

4,612,870

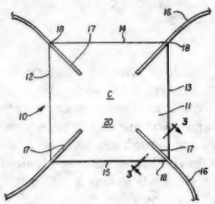
STRUCTURES AND METHODS OF FORMING SEA ANCHORS

Daniel C. Shewmon, 1940 Byram Dr., Clearwater, Fla. 33515

Filed Jul. 26, 1984, Ser. No. 634,519

Int. Cl.[4] B63B *21/48;* B63H *9/04*

U.S. Cl. 114—311 **19 Claims**



1. A sea anchor apparatus comprising a flexible panel member having front and back sides, at least three side edges and a central portion, said flexible panel member being formed of a single homogenous fabric material so that the threads thereof are substantially continuous between said side edges, said side edges intersecting with one another to form at least three spaced vertexes, each of which are generally aligned through said central portion of said panel member, bail rope means extendable from each of said vertexes of said panel member and having an end portion extending in overlaying relationship to the back side of said panel member, seam means connecting each of said end portions of said bail rope means to said back side of said panel member so that said bail rope means are sewn to and extend from each of said vertexes toward said central portion of said panel member, said seam means and said bail rope means terminating in spaced relationship from said central portion of said panel member, and each of said bail rope means extending outwardly from said panel member a generally equal distance with respect to said central portion of said panel member.

4,612,871

DEVICE FOR VISUALLY SETTING THE SPRING FORCE OF A SEAT SUSPENSION FOR A VEHICLE

Sakamoto Takao, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1985, Ser. No. 688,297

Int. Cl.[4] F21Q *3/00*

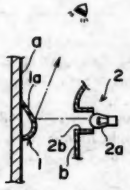
U.S. Cl. 116—202 **3 Claims**

1. A device for visually setting the spring force of a seat suspension for use in a seat of a vehicle, said device comprising:

a light reflective means provided on an inner wall of a door of said vehicle, said light reflective means being disposed thereon at a position whereby the spring force of said seat suspension can be adjusted properly in relation to the weight of an occupant seated on said seat; and

optical means for establishing optical communication with said light reflective means, said optical means being provided at a lateral side of said seat, said optical means being positioned at a height corresponding to the position of said light reflective means for proper adjustment of the spring force of said seat suspension, wherein a light is visualized

by said occupant on said light reflective means from said optical means, thereby allowing said occupant to visually



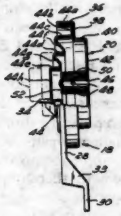
ascertain that the spring force of said seat suspension is adjusted properly in relation to the weight of the occupant.

4,612,872

METHOD OF OPERATING AN EXPANDABLE CHAMBER WITH DELAY VALVE

Robert C. Whelchel, Newport Beach, Calif., and Roger S. Sanderson, 24662 Santa Clara, Dana Point, Calif. 92629, assignors to Roger S. Sanderson, Dana Point, Calif.

Filed Jul. 8, 1983, Ser. No. 512,151
Int. Cl.[4] G01K *11/08, 5/34*
U.S. Cl. 116—218 6 Claims



1. A method of providing an indication of whether a steam phase of a sterilizing cycle in a sterilizer has been adequate to sterilize articles, comprising:

placing in an enclosed area to be sterilized, an indicator comprising an expandable chamber having means in a wall, forming a valve port, said valve port being open when the chamber is placed in said area;

applying pressurized steam to said area causing steam to enter the port thus applying steam to the expandable chamber;

providing means applying a valve closing force to an element for closing said port to capture a quantity of said steam in the chamber;

said element being constructed and arranged so as to delay the closing of said port and the capture of steam until steam of a predetermined temperature has been applied to the expandable chamber for a predetermined period of time sufficient to sterilize articles placed in said area; and

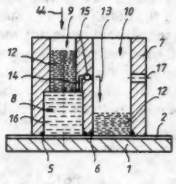
allowing the pressure around the chamber to reduce to ambient pressure relative to the chamber pressure so that the captured steam will cause the chamber to expand thus indicating that pressurized steam of a predetermined temperature was applied for said sufficient time.

4,612,873

CENTRIFUGE CHAMBER FOR CYTODIAGNOSTIC INVESTIGATION OF EPITHELIAL CELLS CONTAINED IN A SAMPLE

Günter Eberle, Tuttlingen, Fed. Rep. of Germany, assignor to Firma Andreas Hettich, Tuttlingen, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 529,126
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232581
Int. Cl.[4] G01N *33/48, 1/28;* B05C *11/08*
U.S. Cl. 118—52 9 Claims



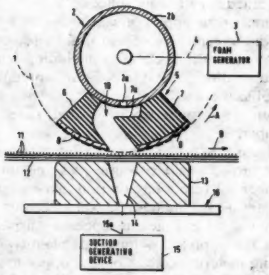
1. A centrifuge chamber for cytodiagnostic investigation of epithelial cells contained in a test sample comprising a carrier plate, a slide fastened on said carrier plate, a sample chamber resting on said slide, said sample chamber including means defining a plurality of bores, said bores being spaced from each other and arranged parallel to each other and being fillable with a sample fluid, each of said bores terminating in end openings, means sealing said bores, at said end openings thereof, to said slide whereby said end openings rest in a sealed fashion on the slide, a flow connection means connecting the bores with each other so as to enable a production of two different slide fields on a single slide from a single sample introduced into the sample chamber.

4,612,874

APPARATUS FOR APPLYING FLOWABLE MEDIA TO WEBS OF TEXTILE MATERIAL OR THE LIKE

Mathias Mitter, Schloss Holte, Fed. Rep. of Germany, assignor to Ramisch Kleinewefers, Krefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 498,949, May 27, 1983, abandoned. This application Oct. 11, 1983, Ser. No. 540,863
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238084
Int. Cl.[4] B05C *3/02;* B41L *13/00;* D06B *1/00*
U.S. Cl. 118—410 30 Claims



1. Apparatus for applying a flowable foamed treating medium to a workpiece, particularly for applying a foamed medium to a running web of carpeting or the like, comprising an applicator including a tubular source of flowable medium having an upper portion and a lower portion provided with at least one opening, said source being arranged to permit at least

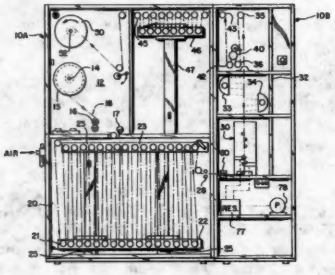
substantially unobstructed flow of foamed medium toward said opening, and means disposed below said source and defining at least one elongated outlet communicating with said opening and arranged to convey the flowable medium from the source to the workpiece, said outlet having a first portion communicating with said opening, a second portion arranged to discharge the medium from the applicator, and a third portion between said first and second portions, said applicator further having at least one deflector means provided in the third portion of said outlet, extending longitudinally of said outlet and arranged to prevent the foamed medium from flowing along a straight path from said opening downwardly from the first to the second portion of said outlet and to the workpiece, said third portion of the outlet having a substantially circular cross-sectional outline and said deflector means comprising an elongated member received with clearance in said third portion and disposed in the path of the medium issuing from the first portion of the outlet so that the medium is compelled to flow around said member on its way into the second portion of said outlet.

4,612,875

FILM COATER

John B. Keable, Kettering, Ohio, assignor to QMI Corporation, Centerville, Ohio

Filed Mar. 25, 1985, Ser. No. 715,447
Int. Cl.[4] B05C *1/08, 11/02*
U.S. Cl. 118—670 **6 Claims**



1. Apparatus for coating roll film, such as strips of 35 millimeter processed film connected in series by splices, with a protective ultraviolet curable coating applied to the opposite surfaces of said film strip, comprising:

means for supporting a first spool of uncoated strips of said film joined together by splices,

coater means for applying said ultraviolet curable coating material to each side of said film strips,

an ultraviolet curing chamber including lamp means positioned to direct ultraviolet light simultaneously to each side of said coated film strips,

a take-up spool for receiving coated, cured film from said chamber,

film drive means for causing said film to move from said first spool through said coater means and ultraviolet drying chamber for respooling on said take-up spool,

said coater means including a pair of coater applicator rolls positioned to engage the opposite surfaces of said film strips for applying a metered quantity of said curable coating material to each of said opposite surfaces,

a plurality of smoothing rods including at least one smoothing rod positioned to engage each side of said film,

controllable motor means for individually driving said applicator rolls and said rods in a direction contra to the movement of said film strips thereby,

a splice detector positioned upstream of said coater means to detect the passage of splices thereby, and

motor control means controlled by said splice detector means for momentarily interrupting the operation of said said motor means sequentially concurrently with the passage of a detected splice past each said coater applicator rolls and said smoothing rods.

4,612,876

AQUARIUM

Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Ft. Worth, Tex.

Continuation-in-part of Ser. No. 686,656, Dec. 27, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,639
Int. Cl.[4] A01K *64/00*
U.S. Cl. 119—5 **3 Claims**

1. An aquarium for maintaining fish and the like comprising:

a. an upper transparent container means for holding water and fish; said transparent container means having integrally molded bottom and side walls so as to be a unitary and waterproof without a leak of water therefrom and having a first size of first predetermined dimensions laterally not to exceed one foot;

b. a base supporting said transparent container means and having a second size of second predetermined dimension laterally sufficient to support said transparent container means;

c. an air pump for pumping an oxygen-containing gas through said transparent container means;

d. at least one air conduit connected with said transparent container means and said air pump to define a conductive air passageway from said air pump to said transparent container means;

e. an air flow control valve disposed in said air passageway such that the rate of flow of said oxygen-containing gas can be adjusted to a desired rate to prevent killing the fish;

said air pump, air conduits and air flow control valve being disposed in said base out of sight, said upper transparent container means having integrally formed side wall, bottom and a valve body in said bottom for alleviating problems with leaking said valve body having a protector sleeve and a nipple protruding beneath said bottom and defining a passageway through said bottom and interiorly of said transparent container means with an air inlet penetrating above the bottom of said transparent container means such that an oxygen-containing gas can be bubbled upwardly through said water in said upper transparent container means without leaking; and a check valve above said nipple for preventing water from running into said air passageway thereby preventing water from running from said transparent container through said air inlet; said valve body and said air inlet protruding upwardly from said bottom into said transparent container means for a distance sufficient to allow simulated gravel to be disposed in said bottom and about said check valve such that said oxygen-containing gas can be bubbled upwardly without agitating settlings in said simulated gravel; and

f. simulated gravel disposed in said bottom so as to receive settlings from the water in said upper transparent container means.

4,612,877

MULTIPLE PURPOSE ANIMAL EAR TAG SYSTEM

Norman J. Hayes, 36 Rd. 2, ABN, Cody, Wyo. 82414, and Richard J. Shaw, 13525 W. Keefe Ave., Brookfield, Wis. 53005

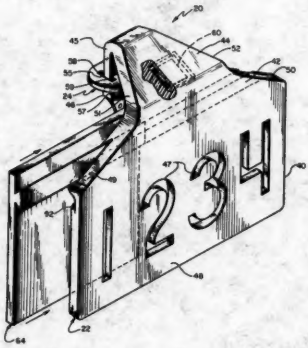
Filed Nov. 28, 1984, Ser. No. 675,529
Int. Cl.[4] A01K *13/00;* **G09F** *3/00*
U.S. Cl. 119—156 **33 Claims**

1. An ear tag assembly for mounting on the ear of a bovine-type animal or the like having an upper ear portion, a rear end portion, and a front ear portion with a central pocket beneath said upper ear portion between said front ear portion and said rear ear portion, and the assembly comprising:

a one-piece tag retaining member made of molded plastic material having a generally flat upper surface for engaging

an inner surface of the upper ear portion, with a generally vertically extending central slot means therein and a flexible lip means adjacent said central slot means, adapted to be located in the central pocket of the animal ear in a substantially horizontal attitude opposite a generally vertically extending slit in the upper ear portion of the animal ear; and

a one piece identification member made of flexible plastic material with an enlarged identification portion located in front of the animal ear, in downwardly generally vertically extending relationship to the upper ear portion, an intermediate portion of reduced width relative to said



identification portion and located adjacent the upper ear portion and the front ear portion; a generally vertically downwardly extending strap portion of reduced width relative to said intermediate portion extending through the generally vertically extending slit in the animal ear and the generally vertically extending central slot means in said one piece tag retaining member, and a generally vertically downwardly extending head portion located below the upper ear portion and mounted in abutting engagement with said flexible lip means and located below a generally horizontally extending portion of said one piece tag retaining member located below the upper ear portion.

4,612,878

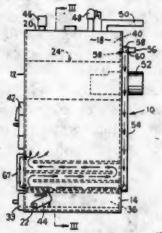
WOOD-BURNING HEATER FOR CIRCULATING WATER

John W. Schnurer, Doyle Township, Schoolcraft County, Mich., assignor to Ralph H. Hoover, Gulliver, Mich., a part interest

Filed Apr. 24, 1985, Ser. No. 726,458

Int. Cl.[4] F22B *5/00*; F23B *7/00*; F24D *9/00*; F24B *9/04*

U.S. Cl. 122—15 **5 Claims**



1. A wood burning furnace and boiler comprising:

a furnace housing having front and rear walls, opposite side walls, and top and bottom walls;

a firebox within said furnace housing and having a grate and spaced side walls, each firebox side wall being spaced from and facing a side wall of said furnace housing;

a boiler chamber defined between the furnace housing and the firebox, said boiler chamber including an upper portion and two lower portions defined between said facing side walls on opposite sides of said firebox, said lower portions extending downwardly substantially to said grate, the upper ends of said lower portion being joined to said upper portion;

a water preheat chamber comprising an auxiliary jacket connected to the rear wall of said furnace housing in heat transfer relationship therewith, said preheat chamber having an upper wall and a bottom wall;

water inlet and distribution means located adjacent the upper wall of said preheat chamber for flowing water into, downwardly and through the preheat chamber, said water distribution means being positioned laterally across said preheat chamber and having a plurality of spaced holes through which water flows downwardly into said preheat chamber;

inlet openings communicating the lower end of said preheat chamber and the lower ends of said two lower portions of said boiler chamber for the passage of water from said preheat chamber into said lower portions, said inlet openings being located laterally of said grate;

baffle plates joined to the facing side walls of said furnace housing and said firebox in each of said lower portions of said boiler chamber, said baffle plates in each of said lower portions defining an elongated serpentine flow path extending from its associated inlet opening partway toward said upper portion of said boiler chamber so that the water flows through an elongated flow path in each of said lower portions of said boiler chamber and thence into said upper portion of said boiler chamber, said baffle plates being located directly laterally of said grate; and

means connected to said upper portion of said boiler chamber for the passage of heated water therefrom.

4,612,879

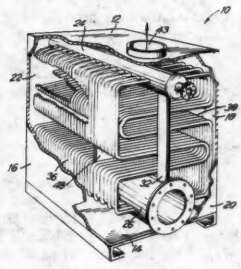
HOT WATER HEATER AND STEAM GENERATOR

George Cooke, Toronto, Canada, assignor to Elizabeth E. Cooke, Toronto, Canada

Filed May 30, 1985, Ser. No. 739,403

Int. Cl.[4] F22B *21/08*

U.S. Cl. 122—235 F **12 Claims**



1. In a boiler comprising a housing having a top provided with a gas outlet, bottom, left and right sides and a front and back, the housing containing a manifold substantially parallel to the top, bottom and side walls, two sets of tubes, each set comprising a plurality of tubes, one set joining the upper manifold on the left and the other set joining the upper manifold on the right, the tubes of each set rising upwardly along their respective side wall, crossing the housing to the opposite side wall, rising adjacent the opposite side wall, re-crossing the housing to their respective side wall, rising therealong and

eventually joining the upper manifold, the horizontal runs of the tubes of one set being vertically offset relative to the horizontal runs of the tubes of the other set so as to form a plurality of superposed chambers above the jacketed chamber, individual tubes of the sets being differently bent so as to form access openings from each chamber to the chambers above and below, the openings from chamber being offset so as to require a gas flowing through said chambers to traverse one chamber form front to back and the next chamber from back to front, means for introducing water into the boiler and for withdrawing steam from the manifold, and means for introducing a hot gas into the lowermost of the superposed chambers, the hot gas rising successively through the chambers which it successively and alternately traverses from front to back and then from back to front until it exits from the uppermost chamber through the gas outlet in the top, water flowing through the tubes being heated by the hot gas, the improvement which comprises a jacketed chamber adjacent the bottom of the housing and substantially parallel to the manifold, the lower ends of the two sets of tubes communicating with the jacket, the jacketed chamber being provided with at least one opening for passage of a hot gas into the next of the superposed chambers, the means for introducing water into the boiler introducing such water into the interior of the jacket from which it flows upwardly through the tubes, and a fuel burner positioned at least partly inside the housing so as to discharge hot combustion gas into the jacketed chamber, whereby upon burning fuel within said jacketed chamber the hot combustion gas rises through the chambers heating the water in the tubes.

4,612,880

METHOD FOR CONTROL OF OCTANE REQUIREMENT INCREASE IN AN INTERNAL COMBUSTION ENGINE HAVING MANIFOLD AND/OR COMBUSTION SURFACES WHICH INHIBIT THE FORMATION OF ENGINE DEPOSITS

Stephen Brass, Fullerton; Michael C. Croudace, Huntington Beach, and Timothy Wusz, Anaheim, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 565,986, Dec. 27, 1983, Pat. No. 4,525,174, which is a continuation-in-part of Ser. No. 451,279, Dec. 20, 1982, Pat. No. 4,444,565. This application Mar. 21, 1985, Ser. No. 714,963

Int. Cl.[4] F02B *75/12*

U.S. Cl. 123—1 A **55 Claims**

1. A method for operating an internal combustion engine with a gasoline combustion charge, which comprises introducing with said combustion charge into said engine an octane requirement increase-inhibiting amount of (a) a gasoline-soluble iron compound and (b) a gasoline-soluble oxygen-containing compound selected from the group consisting of carboxylic acids and ester derivatives thereof, said engine having a combustion surface characterized as having a combination of thermal conductance and thermal penetration properties which inhibit the build-up of deposits resulting from combustion in said engine, without substantially raising the temperature of the incoming combustion charge.

4,612,881

GAS VALVE DRIVING APPARATUS OF A GAS ENGINE

Iwao Tsujimura, Mino, and Katunori Kubo, Toyonaka, both of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

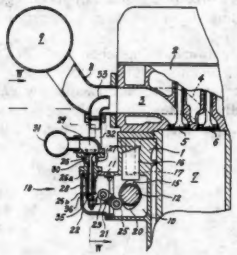
Filed Jun. 23, 1982, Ser. No. 391,446

Claims priority, application Japan, Jun. 24, 1981, 56-94337[U]; Jun. 24, 1981, 56-94338[U]

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—27 GE **5 Claims**

1. A gas valve driving apparatus of a gas engine in which a gas supply passage is connected to an intake means of the engine, comprising a gas valve arranged in the gas supply passage; a gas valve cam provided on a cam shaft in a cam chamber formed by a cylinder block of the engine and being independent of an intake cam and an exhaust cam on the cam shaft; and connecting means for connecting the gas valve cam and the gas valve together, so that the gas valve cam drives the



gas valve through the connecting means, said gas valve and said connecting means being contained in a single unit which is fixed to a wall of the cam chamber and is removable therefrom separate from intake and exhaust valves of the engine.

4,612,882

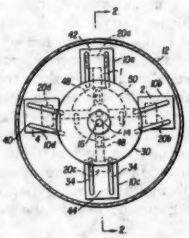
ROTATING CYLINDER INTERNAL COMBUSTION ENGINE

Roberto L. Bonfilio, 47-25 198 St., Auburndale, N.Y. 11358

Filed Apr. 11, 1983, Ser. No. 483,602

Int. Cl.[4] F02B *57/04*

U.S. Cl. 123—44 R **20 Claims**



1. In a rotary internal combustion engine, comprising:

a plurality of radially aligned cylinders collectively supported for common rotation about a first axis and being radially aligned with a second axis displaced from and parallel to said first axis;

a piston block including a piston for each of said cylinders slidable within each said cylinder, said piston block being supported for rotation about said second axis; and

means operatively linking said cylinders with said piston block to rotate said cylinders with said pistons and said piston block while moving said cylinders transversely of said first axis for rotation of said cylinders and pistons together thereby producing relative reciprocal motion of each piston with respect to its cylinder; and

said linking means including means supporting said cylinders for movement transversely of said first axis.

4,612,883

HYDRAULICALLY ACTUATED VALVE TRAIN FOR AN INTERNAL COMBUSTION ENGINE

Frank S. Brisko, Box 38, Ojibwa, Wis. 54862

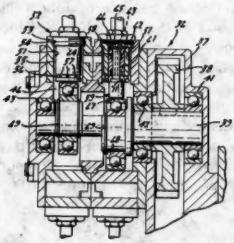
Filed Apr. 18, 1985, Ser. No. 724,819

Int. Cl.[4] F01L *9/02*

U.S. Cl. 123—90.13 **4 Claims**

1. A hydraulically actuated valve train for an internal com-

bustion engine comprising a poppet valve supported for reciprocation for controlling the communication of a port with a chamber of said engine, a fluid actuated piston associated with said poppet valve for operating said poppet valve, and a remotely positioned actuator device for supplying fluid under pressure to said fluid piston, said actuator device comprising a housing defining a fluid chamber and having a bore, means for delivering fluid under pressure to said chamber, said bore communicating with said fluid piston for delivering fluid thereto, a plunger supported in said bore for pressurizing the fluid in said bore, valve means comprising a sleeve slidably supported on said plunger and within said bore for selectively



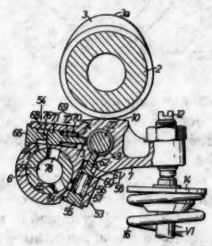
communicating a chamber formed in said bore above said valve sleeve and said plunger with said fluid chamber and for isolating said bore from said fluid chamber, and means for cyclically and sequentially closing said valve for isolating said bore from said fluid chamber and for moving said plunger in said bore for pressurizing said fluid piston and actuating said poppet valve, comprising a first relatively light spring means interposed between said plunger and said valve sleeve for urging the valve sleeve toward a closed position and a second relatively heavier valve spring means acting on said plunger for urging said plunger into engagement with an actuating member for effecting reciprocation of said plunger and said valve sleeve.

4,612,884

VALVE OPERATING AND INTERRUPTING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Yoshio Ajiki, Saitama, and Shigemasa Kajiwara, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,154
Claims priority, application Japan, Jul. 24, 1984, 59-153806
Int. Cl.⁴ F01L *1/34, 1/26*
U.S. Cl. 123—90.16 **28 Claims**



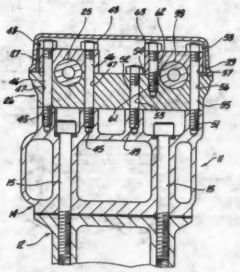
1. A valve operating mechanism for an internal combustion engine having a pair of intake or exhaust valves for each engine cylinder, comprising, a camshaft having high speed and low speed cams thereon, a rocker arm shaft having first, second and third rocker arms pivotally mounted thereon in mutually adjacent relationship, said first and third rocker arms engaging said pair of valves, said first and second rocker arms engaging said low speed and high speed cams, respectively, and piston means in said rocker arms selectively shiftable between positions connecting said rocker arms for pivotal movement in unison and disconnecting said rocker arms for independent movement.

4,612,885

CAMSHAFT BEARING ARRANGEMENT FOR OVERHEAD CAM ENGINE

Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 10, 1985, Ser. No. 721,799
Claims priority, application Japan, Apr. 11, 1984, 59-70953
Int. Cl.⁴ F01L *1/00*
U.S. Cl. 123—90.27 **20 Claims**



1. In an assembly for an internal combustion engine comprising a cylinder block, a cylinder head detachably affixed to said cylinder block by a plurality of threaded fastening means, a plurality of poppet valves supported for reciprocation in said cylinder head, and a camshaft for operating said poppet valves, the improvement comprising a cam carrier detachably affixed to said cylinder head and overlying said threaded fastening means, and a bearing cap affixed to said cam carrier, said cam carrier and said bearing cap having bearing surfaces for journaling said camshaft.

4,612,886

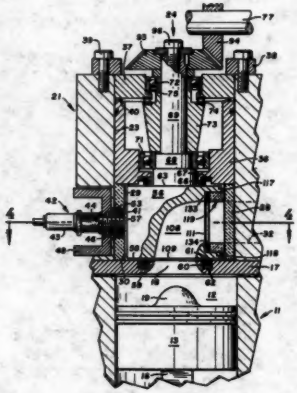
INTERNAL COMBUSTION ENGINE WITH ROTARY COMBUSTION CHAMBER

Craig N. Hansen, Minnetonka, and Paul C. Cross, Minneapolis, both of Minn., assignors to Hansen Engine Corporation, Minnetonka, Minn.

Filed Nov. 15, 1984, Ser. No. 671,573
Int. Cl.⁴ F01L *7/10*
U.S. Cl. 123—190 B **71 Claims**

1. An internal combustion engine comprising: a block having at least one cylindrical wall surrounding a piston chamber, piston means located in said piston chamber, means operable to reciprocate the piston means in said chamber, head means mounted on the block covering said chamber, said head means having an air and fuel intake passage, an exhaust gas passage, a rotary valve assembly operatively associated with the head means for controlling the flow of air and fuel into the rotary valve assembly and piston chamber and the flow of exhaust gas from rotary valve assembly and the piston chamber, said head means having a housing with a bore open to the piston chamber accommodating said rotary valve assembly, said valve assembly comprising a cylindrical sleeve located in said bore, said sleeve having an inner surface, an ignition hole, and intake and exhaust ports aligned with said intake passage and exhaust gas passage, spark generating means mounted on the housing operable to generate a spark, rotatable valving means located within said sleeve for controlling the flow of air and fuel into

said rotary valve assembly and piston chamber and the flow of exhaust gases out of the rotary valve assembly and piston chamber, said rotatable valving means having a valving combustion chamber open to the piston chamber and the inner surface of the sleeve, said rotatable valving means having a valve body, said valving combustion chamber having an inner portion located in the valve body, said valve body having an outer surface spaced from the inner surface of the sleeve, seal



means mounted on the valve body, said seal means having a hole aligned with an outer portion of the valving combustion chamber, biasing means located between the valve body and seal means to bias the seal means into engagement with the inner surface of the sleeve, and means operable to rotate said rotatable valving means in timed relation with the movement of the piston means whereby said engine has an intake, compression, power, and exhaust strokes.

4,612,887

VALVE ACTUATING APPARATUS FOR RESTING THE OPERATION OF A VALVE IN INTERNAL COMBUSTION ENGINE

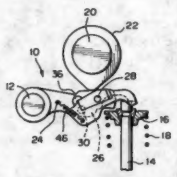
Kouji Yoshizaki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 26, 1985, Ser. No. 780,685

Claims priority, application Japan, Dec. 25, 1984, 59-195440[U]

Int. Cl.[4] F02D *13/06*

U.S. Cl. 123—198 F **6 Claims**



1. A valve actuating apparatus for optionally resting the operation of a valve in an internal combustion engine having a swing rocker arm which is pivoted at one end to a rocker arm shaft and at another end bears against a valve stem of the valve, and a rotatable cam which bears against the rocker arm at an intermediate portion thereof to swing the latter about the rocker arm shaft, said apparatus being applied to said rocker arm which comprises:

a first arm having one end pivoted said rocker arm shaft and the other end extending toward said valve stem;

a second arm having one end bearing against a valve stem and the other end extending toward said rocker arm shaft;

a connecting pin carried by said two arms and extending in parallel to said rocker arm shaft for rotatably interconnecting the respective other ends of said two arms; and

a locking pin carried by one of said two arms and engagable with the other of said two arms to selectively interconnect said two arms, whereby said two arms are brought into a generally straight integral swing rocker arm condition to operate the valve by following the cam when said locking pin interconnects said two arms and said two arms are foldable at said connecting pin by following the cam to rest the operation of the cam when said locking pin releases said two arms; wherein said cam has a center and a cam nose portion which describes a maximum cam lift circle around said center upon rotation, and said connecting pin is located on or just adjacent to a line passing through said center and an intersecting point between a line tangential to said maximum cam lift circle on the upper surface of the first arm and a line tangential to said maximum cam lift circle on the upper surface of the second arm.

4,612,888

DIESEL ENGINE

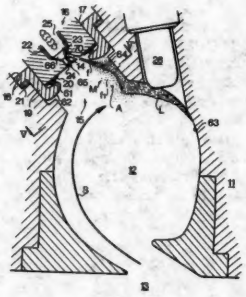
Shiro Ishida, Fujisawa; Yoshihiko Sato, Aso, and Isao Konagaya, Kugenuma, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 16, 1984, Ser. No. 661,532

Claims priority, application Japan, Oct. 18, 1983, 58-193477

Int. Cl.[4] F02B *19/08*

U.S. Cl. 123—261 **4 Claims**

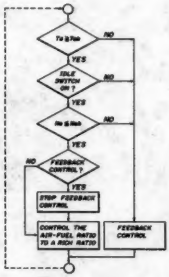


1. A diesel engine comprising a cylinder head, an auxiliary combustion chamber defined in said cylinder head and having an inner wall surface, an atomization passage communicating with said auxiliary chamber and having an inner wall surface, and a fuel injection nozzle means in said cylinder head and having a primary injection port opening into said auxiliary combustion chamber and a secondary injection port opening toward said inner wall surface of said atomization passage, said fuel injection means injecting fuel only through said secondary injection port while keeping said primary injection port closed when said diesel engine is under a low load, said atomization passage being defined by a depression in the inner wall surface of said auxiliary combustion chamber and disposed between said auxiliary combustion chamber and said fuel injection nozzle means.

4,612,889
IDLE CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE

Takayuki Sugiura, and Takahisa Hasegawa, both of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 3, 1985, Ser. No. 804,012
Claims priority, application Japan, Dec. 28, 1984, 59-274939
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—339 **6 Claims**



1. A method of controlling an air-fuel ratio of an air-fuel mixture for an internal combustion engine which has detecting means to detect the value of at least one exhaust component, comprising the steps of:

detecting an intake air temperature, an operating state and a rotating speed of the engine using said detecting means;

inputting detection signals generated by said detecting means to a control circuit;

causing said control circuit to normally control the air-fuel ratio of the air-fuel mixture for the engine so that it is a value in a theoretical air-fuel ratio range; and

causing said control circuit to stop said normal control when the intake air temperature is above a predetermined temperature, the operating state of the engine is in the idle operating state, and the rotating speed of the engine is below a predetermined rotating speed, and to instead control the air-fuel ratio of the air-fuel mixture to be a rich, predetermined air-fuel ratio during such conditions.

4,612,890
CENTRIFUGAL GOVERNOR FOR INTERNAL COMBUSTION ENGINES

Masanori Ohnishi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,282
Claims priority, application Japan, May 2, 1984, 59-64874[U]
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—373 **1 Claim**

1. A centrifugal governor for use with an internal combustion engine, comprising:

a control rack for regulating the quantity of fuel to be supplied to said engine;

flyweights radially displaceable in response to the rotational speed of said engine;

a tension lever pivotable through an angle dependent upon the amount of radial displacement of said flyweights;

an idling spring for urging said tension lever against radially outward displacement of said flyweights;

a torque cam having a cam surface determining a fuel increment to be applied at the start of said engine;

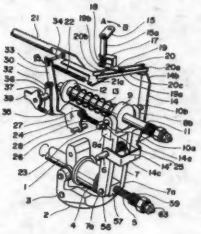
a sensor lever having one end engaged by said control rack, said sensor lever having another end adapted to engage with said cam surface of said torque cam when said engine is in a starting condition, to cause displacement of said control rack into a fuel increasing position for the start of said engine;

a cancelling spring interposed between said torque cam and said tension lever and urging said torque cam with a force dependent upon the angularity of said tension lever in a direction of disengaging said sensor lever from said cam surface of said torque cam;

a control lever;

a floating lever interlocking with said control lever operable at human will and having one end engaged by said control rack and another end by said tension lever, respectively; and

spring force adjusting means arranged at one end of said idling spring and adapted to expand at low temperatures below a predetermined value and contract at high temperatures above said predetermined value, whereby said idling spring has a force thereof increased at a low temperature below said predetermined value to thereby prohibit pivotal movement of said tension lever counteracting the force of said idling spring;



said spring force adjusting means comprising:

at least a first spring and a second spring, one of said first and second springs being formed of a thermosensitive material having a smaller spring constant at a low temperature below said predetermined value, and a large spring constant at a high temperature above said predetermined value; and

first end plate member and a second end plate member, between which said first and second springs are interposed, said one of said first and second springs pulling said first and second end plate members in directions toward each other, the other one of said first and second springs urging said first and second end plate members in directions away from each other.

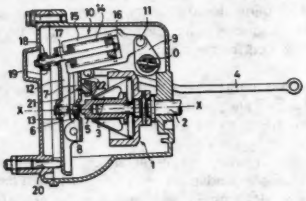
4,612,891
FEEDING GOVERNOR OF A DIESEL CYCLE ENGINE IN THE STARTING STAGE

Carlo Doveri, Pontedera, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Dec. 19, 1984, Ser. No. 683,690
Claims priority, application Italy, Dec. 23, 1983, 24368 A/83
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—373 **1 Claim**

1. An automatic governor for a fuel injector pump of an internal combustion engine comprising a housing, a slider control member moved by a centrifugal weight arrangement, a lever arrangement having a pivot point fixed to the housing, the lever arrangement comprising a first lever pivotally connected to a control rod of the injector pump, a second lever pivotably connected to the first lever at said pivot point, the second lever being spring biased to the first lever by a first spring member, the second lever further being biased by a second and third spring, the first lever capable of being moved by the slider control member at a predetermined engine speed, the first lever having a rest position during starting of the engine whereby the fuel injection pump delivers a maximum fuel output, a magnet fixed to said housing capable of maintain-

ing the first lever in the rest position to ensure maximum fuel output during starting, the governor being arranged such that



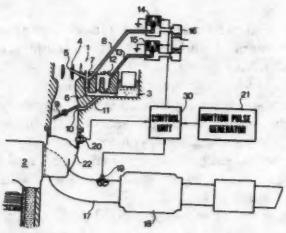
when the engine starts the first lever and control rod actuate the fuel pump to reduce delivery of fuel corresponding to an idle speed.

4,612,892

AIR-FUEL RATIO CONTROL SYSTEM

Toshikazu Iwanaga, Mitaka, and Kazuo Hara, Musashino, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,415
Claims priority, application Japan, Oct. 22, 1984, 59-222625
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—438 **3 Claims**



1. In an air-fuel ratio control system for an internal combustion engine having an induction passage, means for supplying air-fuel mixture, an electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied by the supply means, an O_2 sensor for detecting oxygen concentration in exhaust gases, and a feedback control circuit including comparator means for comparing the output of the O_2 sensor with a reference value and for producing an output signal responsive to the comparison, PI circuit means responsive to the output signal of the comparator means for producing a PI value, and pulse generating circuit means responsive to the PI value for generating pulses duty ratio of which is dependent on the PI value, the pulses being for driving the electromagnetic valve to correct the air-fuel ratio, the improvement comprising:

engine speed detecting means for producing an engine speed signal when the engine speed is lower than a predetermined engine speed;

engine deceleration detecting means for producing a deceleration signal at a predetermined deceleration;

deciding means responsive to the engine speed signal and deceleration signal for producing a particular idling signal;

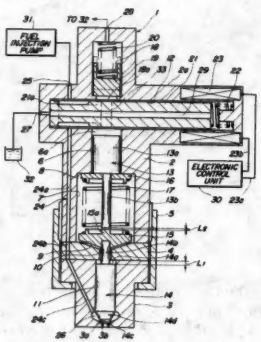
correcting means responsive to the particular idling signal for correcting the PI value to a PI value operative to rapidly changing the duty ratio of the pulses so as to enrich the air-fuel mixture.

4,612,893

FUEL INJECTION VALVE

Toru Ishibashi, and Shigeo Taira, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,414
Claims priority, application Japan, Nov. 14, 1984, 59-238290
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—447 **2 Claims**



1. In a fuel injection valve for an internal combustion engine, including a main body having injection holes formed in a tip thereof and a fuel intake passageway formed therein and communicating with said injection holes, a nozzle needle slidably fitted within said main body for alternately closing and opening said injection holes, a plunger chamber defined within said main body, a lift-limiting plunger slidably fitted in said plunger chamber and having an end face remote from said nozzle needle disposed as a pressure-receiving surface to receive fuel pressure for limiting the lifting amount of said nozzle needle, a back pressure chamber defined by said end face of said plunger remote from said nozzle needle as part of said plunger chamber, a selector valve disposed to selectively establish or interrupt communication between said back pressure chamber and said fuel intake passageway, and control means for controlling said selector valve in dependence on operating conditions of said engine, wherein when said engine is operating in a predetermined low speed/low load condition, said selector valve is controlled by said control means to establish communication between said back pressure chamber and said fuel intake passageway, whereby said nozzle needle is lifted through a limited stroke to obtain a reduced fuel injection rate as well as a prolonged fuel injection period, the improvement comprising: a pressure inlet chamber permanently communicating with said back pressure chamber and disposed to be selectively communicated with said fuel intake passageway and disconnected therefrom by said selector valve, in synchronism with said selective establishment and interruption of communication between said back pressure chamber and said fuel intake passageway; an accumulator chamber communicating with said pressure inlet chamber; an accumulator slidably fitted within said accumulator chamber and liftable in a direction away from said pressure inlet chamber with an increase in the pressure within said pressure inlet chamber; and urging means urging said accumulator in a direction toward said pressure inlet chamber against lifting of said accumulator.

4,612,894
CONTROL SYSTEM FOR AN ENGINE HAVING AIR PASSAGE

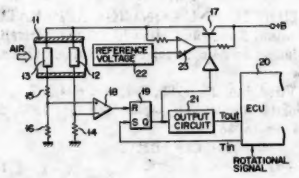
Yoshihisa Satoh, Nagoya; Susumu Akiyoma, Kariya; Katsunori Ito, Aichi; Katsuhiro Ina; Masumi Kinugawa, both of Okazaki, and Atsushi Suzuki, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 25, 1985, Ser. No. 791,526

Claims priority, application Japan, Oct. 26, 1984, 59-225324; Nov. 22, 1984, 59-247422

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—494 **9 Claims**



1. A control system for an engine having an intake air passage, comprising:

means for generating a first pulse signal;

means disposed in said air intake passage for generating heat in accordance with an electric power supplied thereto;

means for comparing the temperature of said heat generating means with reference temperature;

means for generating a second pulse signal starting in response to the first pulse signal and ending in response to an output of said comparing means indicating that the temperature of said heat generating means attains the reference temperature;

means for supplying said heat generating means with the electric power during a period of said second pulse signal;

means for measuring an interval of time from the starting of said first pulse signal to the starting of said second pulse signal;

time lag interval discriminating means for generating a discrimination signal when the interval of time measured by said time interval measuring means is shorter than a predetermined interval; and

means for detecting an amount of air on the basis of the interval of time of said second pulse signal only when said time lag discriminating means generates the discrimination signal.

4,612,895
FUEL FLOW DETECTOR AND FUEL CONTROLLER USING FUEL FLOW DETECTOR

Hiroshi Kuroiwa, Hitachi; Yutaka Nishimura, and Yoshishige Oyama, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,660

Claims priority, application Japan, Sep. 7, 1983, 58-163121

Int. Cl.⁴ F02B *3/00*

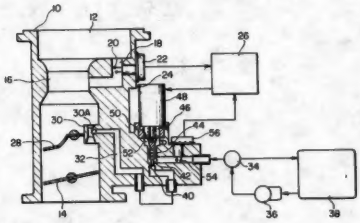
U.S. Cl. 123—494 **4 Claims**

1. A fuel controller, comprising:

(a) air detecting means including a first flow measuring resistance to be disposed in a suction air passage and having a temperature dependency characteristic and a first temperature compensating resistance having a temperature dependency characteristic similar to said first flow measuring resistance for measuring air flow in said suction air passage;

(b) fuel detecting means including a second flow measuring resistance to be disposed in a fuel passage and having a temperature dependency characteristic similar to said first flow measuring resistance and a second temperature compensating resistance for measuring fuel flow in said fuel passage;

(c) correcting means provided in said air detecting means and said fuel detecting means so as to minimize the ratio $\Delta Y\alpha/DTf$ of a temperature difference ΔTa between said first low measuring resistance and said first temperature compensating resistance to a temperature difference ΔTf between said second flow measuring resistance and said



second temperature compensating resistance in accordance with a temperature rise;

(d) controlling means for generating a control signal to regulate the flow of fuel so that signals of said air detecting means and said fuel detecting means are related in a predetermined manner to each other; and

(e) fuel flow regulating means for controlling the fuel flowing in said fuel passage according to the control signal of said controlling means.

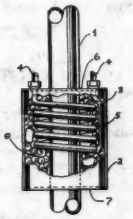
4,612,896
DIESEL FUEL HEATER

John G. Leibrand, Sr., Adelanto, Calif., assignor to "A" Co., Riverton, Wyo.

Filed Sep. 3, 1985, Ser. No. 772,263

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—557 **5 Claims**



1. In a diesel internal combustion engine fuel heater having a cylindrical canister circumferentially attached to the exhaust conduit of the diesel engine, enclosed within the canister a helically wound fuel line spaced at all points from the exhaust conduit, the top, sides, and bottom of the canister, the space between the exhaust conduit, the fuel line and the inner surfaces of the canister being substantially filled with a thermal conductive material wherein the improvements comprise:

a. the thermal conductive mixture consisting of 85% rounded pellets of dense fire brick to 15% platinized pellets;

b. The pellets of fire brick varying in diameter from three to ten millimeters; and,

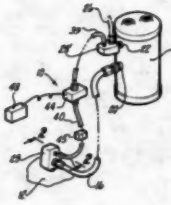
c. the platinized pellets being approximately 14 millimeters in diameter to 6 to 20 millimeters in length.

4,612,897

HEATED FUEL DELIVERY SYSTEM FITTING AND METHOD

Leland L. Davis, Saline, Mich., assignor to Davco Manufacturing Corporation, Ann Arbor, Mich.

Filed Sep. 24, 1984, Ser. No. 653,854
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—557 13 Claims



1. In a fuel supply system for a combustion apparatus including a fuel tank, a fuel heater, a primary flow conduit connected to said fuel tank and said fuel heater, and a supply conduit connected to said fuel heater for supplying fuel to said combustion apparatus, the improvement comprising:

a first fitting means having a primary flow inlet in fluid communication with an outlet port of said fluid heating apparatus, said first fitting means further having a primary flow outlet connected to said supply conduit and a backflow port,

a second fitting means having a primary flow inlet in fluid communication with said fuel tank, a primary flow outlet connected to said primary flow conduit, and a backflow port,

backflow conduit means communicating with said first fitting means backflow port with said second fitting means backflow port, and

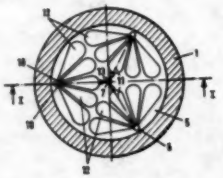
pump means causing warmed fuel from said first fitting means backflow port to flow to said second fitting means backflow port wherein warmed fuel from said first fitting means mixes with fuel in said second fitting means thereby warming said second fitting means and fuel therein.

4,612,898

CYLINDER HEAD FOR A PISTON INTERNAL COMBUSTION ENGINE

Anton Steiger, Illnau, and Robert Hofer, Elgg, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 4, 1985, Ser. No. 707,570
Claims priority, application Switzerland, Jan. 11, 1985, 127/85
Int. Cl.[4] F02B *3/06*; F02M *43/00*
U.S. Cl. 123—299 8 Claims



1. In combination

a cylinder head for a piston internal combustion engine having a central longitudinal axis;

at least two fuel injection nozzles peripherally mounted in said head symmetrically of said longitudinal axis for injecting non-self-igniting main fuel; and

a third fuel injection nozzle mounted on said head on said longitudinal axis for injecting an ignition fuel;

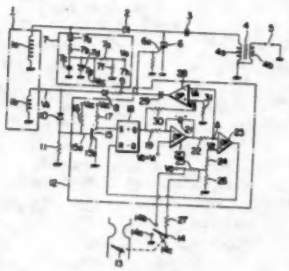
each peripherally mounted nozzle having a plurality of nozzle openings arranged symmetrically of a clearance plane between said third nozzle and said respective peripherally mounted nozzle, said openings being formed to eject a jet of fuel having a twist-free distribution relative to said longitudinal axis.

4,612,899

IGNITION TIMING CONTROL APPARATUS

Yoshihisa Honjoh, Kako, and Hiroshi Okuda, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 694,967
Claims priority, application Japan, Jan. 31, 1984, 59-16247; Jan. 31, 1984, 59-16248
Int. Cl.[4] F02P *5/02*
U.S. Cl. 123—413 16 Claims



1. An ignition timing control apparatus comprising:

an ignition power source for generating power for the ignition of said engine;

a switching element for respectively connecting and disconnecting the power from said ignition power source to the ignition coil of said engine at a predetermined time;

signal generator means for generating signals for setting an ignition timing corresponding to the revolutions of said engine;

an ignition timing control circuit for computing ignition timing for said engine on the basis of signals from said signal generator means and providing an ignition signal representing said ignition timing to said switching element; and

a throttle switch interlocked with a throttle valve of said engine and having a first contact in a closed position when the throttle valve is fully opened and a second contact in a closed position when the throttle valve is fully closed, said first and second contacts being both opened between the fully opened and fully closed positions of said throttle valve;

said ignition timing control circuit including means for setting the ignition timing in an advanced angle condition and means for setting the ignition timing in a retarded angle condition, means for retaining the ignition timing in the advanced angle condition as set by said setting means when the throttle switch closes the first contact, means for retaining the ignition timing in the retarded angle condition as set by said setting means when the throttle switch closes the second contact, and means for advancing the ignition timing corresponding to the revolutions of said engine according to the signals from said signal generator means between the fully closed and the fully opened

positions of said throttle valve when the first and second contacts of the throttle switch are both opened.

4,612,900

ENGINE OPERATING PARAMETER CONTROL APPARATUS

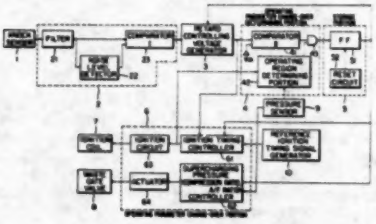
Toshio Iwata; Satoshi Komurasaki, and Atsushi Ueda, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,387

Claims priority, application Japan, Feb. 24, 1984, 59-34572; Mar. 22, 1984, 59-56711

Int. Cl.⁴ F02P 5/15

U.S. Cl. 123—425 **14 Claims**



1. A control apparatus for an internal combustion engine having a reference ignition timing comprising:

a sensing means for sensing vibrations including knocks of said engine;

knock signal deriving means for deriving knock signals from the output of said sensing means;

a correction magnitude determining means for determining from said knock signals derived by said knock signal deriving means an ignition timing correction magnitude for suppressing the occurrence of knock;

an operating parameter condition sensing means;

an operating parameter change-over determining means for determining a change-over of operating parameter of said engine from the ignition timing correction magnitude and an operating parameter condition of said engine from said parameter condition sensing means;

a storage means for storing the output of said operating parameter change-over determining means; and

an operating parameter change-over means for controllably changing over the condition of the operating parameter of said engine to suppress said knocks of said engine in accordance with the output of said storage means.

4,612,901

ENGINE IGNITION TIMING CONTROL APPARATUS

Toshio Iwata; Satoshi Komurasaki, and Atsushi Ueda, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 707,948

Claims priority, application Japan, Mar. 7, 1984, 59-46116; Mar. 17, 1984, 59-51825

Int. Cl.⁴ F02P 5/15

U.S. Cl. 123—425 **16 Claims**

1. An ignition timing control apparatus for an internal combustion engine having a reference ignition timing comprising:

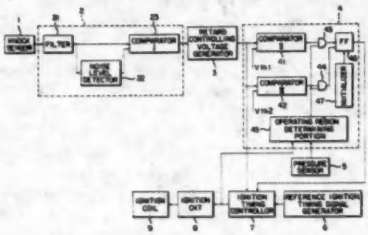
a sensing means for sensing vibrations including knocks of said engine;

knock signal deriving means for deriving knock signals from the output of said sensing means;

a retard controlling voltage generator for determining from said knock signals derived by said knock signal deriving means an ignition timing correction magnitude for suppressing the occurrence of knocks;

an ignition timing change-over determining means for determining whether or not the change-over of the reference ignition timing to a corrected ignition timing is necessary from the knock condition, associated with a fuel used for said engine, provided by said knock signal deriving means;

an initializing means for initializing the output of said ignition timing change-over determining means corresponding to a predetermined retard angle whereby the ignition



timing is initially set at said predetermined retard angle; and

an ignition timing change-over means for changing over the reference ignition timing to an ignition timing reflecting a correction magnitude determined by said retard controlling voltage generator.

4,612,902

KNOCKING CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINE

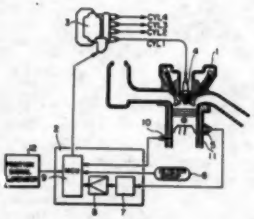
Osamu Abe, Katsuta, and Noboru Sugiura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,681

Claims priority, application Japan, Mar. 28, 1984, 59-58300

Int. Cl.⁴ F02P 5/14

U.S. Cl. 123—425 **8 Claims**



1. A method of controlling ignition timing of an internal combustion engine having a plurality of cylinders in which ignition occus sequentially in a predetermined order, comprising the steps of:

(a) detecting the occurrence of a knocking condition in any one of said cylinders;

(b) determining in which one of said cylinders said knocking condition has occurred;

(c) producing a signal representative of the intensity of the detected knocking condition;

(d) correcting the ignition timing of said any one cylinder based upon said knocking condition intensity representative signal; and

(e) correcting the timings of ignition of those of said cylinders other than said any one cylinder by respective timing values dependent upon the intensity of said knocking condition representative signal adjusted by respective prescribed coefficients for said other cylinders.

5. An apparatus for controlling the ignition timing of an internal combustion engine having a plurality of cylinders on the basis of knocking which occurs in the engine, comprising:

a knock sensor mounted to the engine for detecting the occurrence of a knocking condition in the engine and producing a first signal representation thereof;

means for producing a second signal in response to said first signal and representative of the intensity of the knocking condition represented by said first signal;

means for determining in which one of said cylinders said knocking condition, as represented by said first signal, has occurred;

means for correcting the ignition timing of said one cylinder based on said second signal; and

means for correcting the timing of ignition of those of said cylinders other than said one cylinder by respective timing values dependent upon said second signal adjusted by respective prescribed coefficients for the other cylinders.

4,612,903

INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING MULTIPLE INLET VALVES

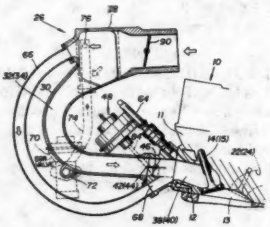
Suehiro Urabe, Yokohoma, and Yoshio Iwasa, Nagareyama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Apr. 11, 1985, Ser. No. 721,952

Claims priority, application Japan, Apr. 24, 1984, 59-81049

Int. Cl.[4] F02B *15/00*

U.S. Cl. 123—432 **9 Claims**



1. In an internal combustion engine

means defining a combustion chamber;

first and second induction ports leading to said combustion chamber;

first and second inlet valves for controlling fluid communication between said combustion chamber and said first and second induction ports respectively;

an induction manifold including a collector section and a structure which defines first and second induction conduits which lead from said collector section to said first and second induction ports respectively;

first and second flow control valves disposed in said first and second conduits respectively, said first and second flow control valves being located upstream of said first and second inlet valves;

a third flow control valve upstream of said collector, said third valve controlling the amount of air which enters said collector;

a device for causing said first and second flow control valves to close independently of said third flow control valve and prevent the flow of fluid from said collector section to said combustion chamber during a predetermined first mode of engine operation and for opening said valves when said engine enters a second predetermined mode of engine operation;

a third induction port, said third induction port being arranged to merge with said first port at an acute angle at a location downstream of said first flow control valve; and

a single third conduit which leads from said collector section to said third port; said first, second, and third conduits constituting the entire flow path from said collector section to said induction ports;

the length and cross sectional area of the flow paths defined between said collector section and said combustion chamber via said first and second induction conduits and first and second induction ports being selected to induce good induction efficiency during said second mode of engine operation and the length and cross sectional area of the flow path defined between said collector section and said combustion chamber via said third conduit and third port selected to induce good induction efficiency during said first mode of engine operation.

4,612,904

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

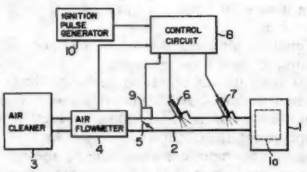
Tomoo Tadokoro, and Haruo Okimoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 14, 1984, Ser. No. 579,962

Claims priority, application Japan, Feb. 15, 1983, 58-24445; Nov. 8, 1983, 58-209648

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—492 **19 Claims**



1. A fuel injection system for an engine having combustion chamber means and intake passage means leading to said combustion chamber means, said fuel injection system comprising first and second fuel injection valve means located in said intake passage means so that one of said fuel injection valve means is closer to said combustion chamber means than the other, control means for producing first synchronized fuel injection pulses which are produced at timings synchronized with engine rotation throughout an engine operating range including light load engine operation and heavy load engine operation and adapted to be applied to said first fuel injection valve means to actuate the same, and for producing second synchronized fuel injection pulses which are produced at timings synchronized with the engine rotation only during heavy load engine operation and adapted to be applied to said second fuel injection valve means to actuate the same, said first and second synchronized fuel injection pulses providing a basic fuel supply quantity which is determined in accordance with an engine operating condition, acceleration detecting means for detecting a demand for acceleration of the engine, said control means including means for producing non-synchronized fuel injection pulses when a demand for engine acceleration is detected by the acceleration detecting means, said non-synchronized fuel injection pulses applied to said fuel injection valve means closer to said combustion chamber means for providing a supply of fuel in addition to said basic fuel quantity at timings not synchronized with the engine rotation, and means for increasing widths of said first and second synchronized fuel injection pulses when demand for engine acceleration is detected and for providing additional fuel at timings synchronized with the engine rotation.

4,612,905

FUEL INJECTION APPARATUS

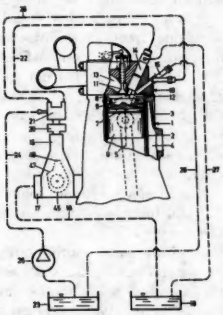
Werner Dietrich, Heppenheim, and Richard Kinzel, Bensheim, both of Fed. Rep. of Germany, assignors to Motoren-Werke Mannheim AG, vorm. Benz Stat. Motorenba, Mannheim, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,921

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002851; Mar. 25, 1980, 3011376

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—575 **13 Claims**



1. In a fuel injection system, especially for Diesel engines, having a high-pressure injection pump for injecting hard-to-ignite main fuel via at least one main fuel injection nozzle set to open at a given pressure and including a separate pump for the igniter fuel and at least one igniter fuel injection nozzle arranged behind the separate pump and also set to open at a given pressure, the improvement wherein said separate pump comprises a low-pressure pump (**25**), said low-pressure pump (**25**) being connected to a pre-storage chamber (**31, 31', 31", 31'"**) disposed in a pressure divider (**21, 21', 21", 21'"**) and including an expulsion piston (**33, 33', 33", 33'"**) operatively associated with said pre-storage chamber (**31, 31', 31", 31'"**) and arranged to be actuated by the pressure of the main fuel.

4,612,906

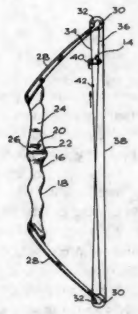
COMPOUND ARCHERY BOW ASSEMBLY

Vincent F. Troncoso, 14090-6100 Rd., Montrose, Colo. 81401

Filed Jan. 4, 1985, Ser. No. 688,818

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—24 R **8 Claims**



1. An improved compound archery bow assembly with novel drawcheck, said assembly comprising, in combination:

a. a compound archery bow having

i. a pair of spaced bow limbs at opposite ends thereof,

ii. a handle with an arrow rest on one side thereof adapted to position an arrow horizontally relative to said bow, said handle inter-connecting said bow limbs,

iii. pulleys connected to said limbs,

iv. first and second pulley cables trained around said pulleys and spanning said bow and,

v. a bowstring connected to said cables; and,

b. an arrow drawcheck comprising

i. an activator component comprising a protuberance extending from and connected only to said first cable in a position vertically displaced from said arrow rest and out of the path of said arrow, such that said activtor component moves with said first cable during drawing of said bowstring, and,

ii. a drawcheck indicator component releasably connected only to said second cable adjacent said first cable and vertically displaced from said arrow rest and out of the path of said arrow, said indicator component being movable with said second cable and including flexible clicker blade which audibly clicks when it is temporarily flexed by said activator component during passage thereby and then allowed to snap against another portion of said indicator component to indicate a predetermined full draw position of said bowstring.

4,612,907

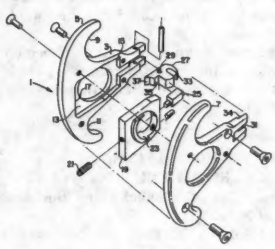
ARCHERY RELEASE AID

John V. Gantt, Pickens, S.C., assignor to Gatomba, Inc., Pickens, S.C.

Filed Nov. 28, 1983, Ser. No. 555,717

Int. Cl.[4] F41C *19/00*

U.S. Cl. 124—35 A **7 Claims**



1. An archery release aid comprising:

a housing having a distal end and a proximal end defining finger grips and a trigger cavity;

a trigger in said trigger cavity;

biasing means biasing said trigger toward said distal end;

a pivoted string engaging member pivotally mounted on said housing at said distal end pivoting from a first position defining with said housing a closed string path whereby a bow string is retained within said release aid and a second position to define an open string path to release said bow string;

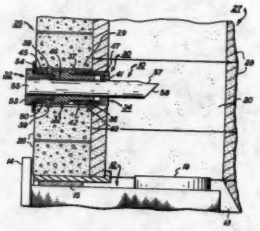
locking means extending from said trigger to said string engaging member to lock said string engaging member in said first position, said biasing means normally biasing said trigger and said locking means toward said string engaging member to lock said member in said first position;

said trigger defining a finger hole to permit finger movement of said trigger toward a proximal end of said trigger cavity and the proximal end of said housing against the biasing thereof to disengage said locking means and permit said pivoted string engaging member to pivot to said second position for release of a bow string.

4,612,908
VIEWING INSTRUMENT FOR CHIMNEY

Frederic D. Van Patten, R.D. 1, Stock Rd., Hannibal, N.Y. 13074

Filed Jun. 24, 1985, Ser. No. 747,870
Int. Cl.[4] F24D *15/04*
U.S. Cl. 126—200 4 Claims



1. Apparatus for visually monitoring the vent of a chimney while the chimney is drawing exhaust gases from a fire through a flue opening that includes

a hollow barrel positioned within a horizontal receiving opening that passes from outside the chimney into the chimney vent above the flue entrance,

mounting means joined to the outer end of the barrel for providing an airtight seal with said chimney and having a transparent window for viewing the inside of said chimeny,

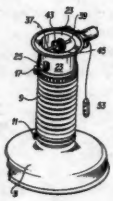
an elongated, heat resistant tube contained within the mounting means that passes through the barrel into the chimney vent, said tube having one end positioned adjacent said window and the opposite end positioned in the chimney vent, said tube further including an opening in the sidewall thereof that faces the top of the chimney, and

a mirror means positioned beneath the opening for directing light entering the top of the chimney through said tube toward the window whereby the chimney vent can be viewed through the window.

4,612,909
ROOM EXHAUST DUCT

Chi-Min Lee, #201-24 Yeokkok-Dong Buchunshi, Kyeongki-Do, Rep. of Korea

Filed Feb. 22, 1985, Ser. No. 704,571
Int. Cl.[4] F24C *15/20*
U.S. Cl. 126—299 D 1 Claim

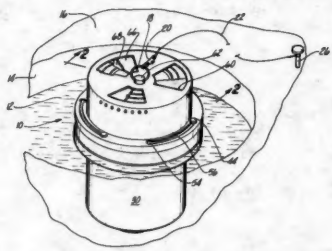


1. A room exhaust duct having a duct for use with a fixed and permanent ceiling exhaust duct in collecting and exhausting grease, smoke, heat, steam and odors from a cooking table, said hood of said room exhaust duct having a lowermost position to maximize such exhaustion and said hood of said room exhaust duct having an uppermost retracted position when not in use for affording unobstructed room space relative to said cooking table; said room exhaust duct comprising said hood and comprising an accordion-like flexible duct, adapter duct, sleeve, hinged ring clamp, reversible hoisting motor, take-up drum reel, coupled shaft, cable and switch; said flexible duct being in interposed, connected and communicative relationship between and with said hood and sleeve, said hood having a neck portion, said accordion-like flexible duct receiving said neck portion, said sleeve receiving said adapter duct in detachable mounting relationship, said adapter duct carrying said hinged ring clamp, said sleeve having an outturned ear integrally formed therewith, said ring clamp being releasably engaged in locking relationship with said outturned ear to effect such detachable mounting relationship of said sleeve and said adapter duct, said adapter duct fixedly mounting said motor, said adapter duct freely mounting said coupled shaft in bearing relationship, said coupled shaft fixedly carrying said drum reel, said coupled shaft and drum reel being disposed interiorly of said adapter duct, said motor having a drive shaft, said coupled shaft being connected to said drive shaft, said cable having ends connected to said drum reel and hood, said switch being electrically connected to said motor to close a circuit upon actuation of said switch to drive said shaft and drum reel in one direction to wind said cable on said drum reel and thereby raise said flexible duct and hood to such uppermost retracted position, and said switch being electrically connected to said motor to close another circuit upon alternate actuation of said switch to drive said shaft and drum reel in an opposite direction to allow said cable, wound on said drum reel, to unwind and thereby lower said flexible duct and hood by force of gravity to such lowermost position.

4,612,910
ICE FISHING HOLE HEATER

Robert E. Williams, 1501 Milbourne, Flint, Mich. 48504

Continuation of Ser. No. 652,665, Sep. 21, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,799
Int. Cl.[4] F24H *1/20*
U.S. Cl. 126—360 R 18 Claims



1. An ice fishing hole heater comprising:

a housing defining an open topped cavity,

heating means adapted to be received in said cavity, and

means for buoyantly supporting said housing and said heating means in a body of water in an upright position, wherein said housing includes a radially expanded ring near the upper portion of said cavity to form a means for radiating heat outwardly from said housing over an expanded surface area and wherein said ring is hollow and communicates with the interior of said housing;

wherein said heating means comprises a fuel receptacle adapted to be received in said housing cavity and having means for generating a flame; and

further comprising deflector means for dispersing said flame, wherein said deflector means comprises a deflector plate and means for supporting said deflector plate on said fuel receptacle, wherein said means for supporting comprises a ring adapted to engage the rim of said fuel receptacle, and

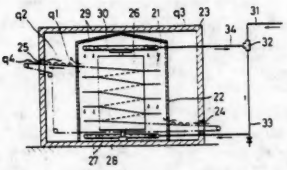
wherein said ring includes a plurality of venting apertures aligned for communication with said hollow ring.

4,612,911

STEAMER OF STEAM CIRCULATION SYSTEM

Masakichi Onodera, 6-27-306, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan

Filed Sep. 23, 1985, Ser. No. 779,093
Int. Cl.[4] F24D *1/00*
U.S. Cl. 126—369 **4 Claims**



1. A conveyor steamer comprising:

a room enclosed with heat-insulated walls, floor, and ceiling, said room having an entrance and an exit for goods to be steamed;

a conveyor means for carrying the goods to be steamed, said conveyor means traversing into the entrance of the room, through the room, and out of the exit of the room;

a source of heated primary steam;

first pipe means, arranged beneath the conveyor means, for jetting said heated primary steam upwardly from across the floor of the room;

second pipe means disposed across the entire ceiling of the room, arranged above the conveyor means, for scavenging spent steam from across the entire ceiling of the room; and

an ejector-condenser means, interconnected between the first pipe means, the source of primary heated steam and the second pipe means, for mixing the spent steam from the second pipe means with the heated primary steam in the first pipe means;

whereby the spent steam mixed with the heated primary steam is caused to recirculate in the first pipe means through the room, thus saving energy and consuming less heated primary steam so that cost reductions will result.

4,612,912

DOUBLE-LAYERED THERMAL ENERGY STORAGE MODULE

W. Dean Lampe, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Filed Sep. 12, 1985, Ser. No. 775,388
Int. Cl.[4] F24J *2/00*
U.S. Cl. 126—400 **1 Claim**

1. A multiple-layered thermal energy storage module, comprising,

at least front and rear upstanding storage sections having upper and lower ends, opposite side edges, and front and rear walls,

a flat sheet positioned between said front and rear storage sections,

said front storage section having a plurality of spaced-apart, quadrilateral shaped phase change material storage tube segments provided therein extend between said side edges, said tube segments being disposed at an angle with respect to said upper and lower ends of said front storage section,

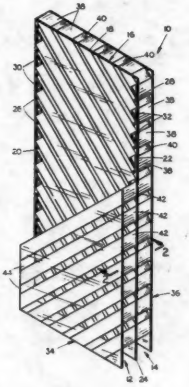
said front storage section having a quadrilateral shaped fluid flow channel segment positioned between said tube segments,

said rear storage section having a plurality of spaced-apart, quadrilateral shaped phase change material storage tube segments provided therein which extend between said side edges, said tube segments of said rear storage section being disposed at an equal but opposite angle to the tube segments of said front storage section,

said rear storage section having a quadrilateral shaped fluid flow channel segment positioned between said tube segments,

a phase change material in said storage tube segments in said front and rear storage sections,

a heat transfer fluid in said channel segments in said front and rear storage sections,



the ends of each of said tube segments in said front storage section in communication with a pair of tube segments in said rear storage section,

the ends of each of said channel segments in said front storage section being in communication with a pair of tube segments in said rear storage section whereby the heat transfer fluid will successively move through a channel segment in said front storage section and thence through a channel segment in said rear storage section.

4,612,913

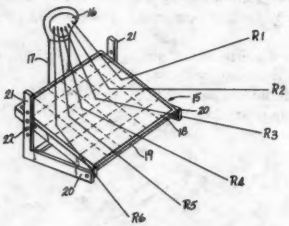
SOLAR ENERGY COLLECTOR ARRAY

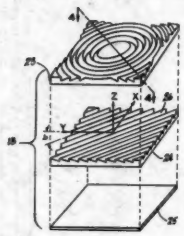
Hiroki Mori, Tokorozawa, Japan, assignor to Ilios Corporation of Japan, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,455
Claims priority, application Japan, Apr. 3, 1984, 59-66133
Int. Cl.[4] F24J *2/10*
U.S. Cl. 126—438 **11 Claims**

1. A concentrating solar reflector adapted to focus light on a target positioned and spaced a predetermined distance from said reflector comprising a lens having optical power and a predetermined equivalent focal length, a linear echelon element having parallel prisms defined thereon closely positioned to said lens, and a mirror surface, said lens, said echelon element and said mirror surface having an optical axis and being so arranged that light entering said lens and said echelon element is refracted and reflected back through said lens to said target for a given angle of incidence of light rays thereon, said echelon element being angularly positioned with respect to the

optical axis such that said prisms refract and said mirror surface reflects to said target for a predetermined angle of incidence of solar rays on said solar reflector, said target being positioned above said reflector.



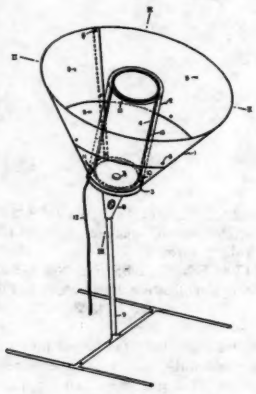


4,612,914

PORTABLE COLLAPSIBLE SOLAR SURVIVAL APPARATUS

Kent A. Dógey, 151 Buckingham Dr., Santa Clara, Calif. 95051

Filed May 7, 1984, Ser. No. 607,901
Int. Cl.⁴ F24J *2/10*
U.S. Cl. 126—438 **5 Claims**



1. In a portable collapsible solar energy conversion apparatus including a base, closure means mounted to said base, funnel-shaped reflector means having a small diameter end mounted to said closure means and extending in a deployed condition therefrom to a large diameter end to concentrate solar energy along a central longitudinal axis of said reflector means, a solar energy absorbing structure carried by said closure means and located to extend along said axis, and a transparent container mounted to said closure means concentrically of and surrounding said energy absorbing structure in spaced relation thereto to provide a convection heat transfer barrier, wherein the improvement in said solar conversion apparatus comprises:

said reflector means and said container are each formed for removal from said closure means;

said reflector means being further formed for collapsing to a stored condition dimensioned for storage inside said container with said energy absorbing structure positioned in said container; and

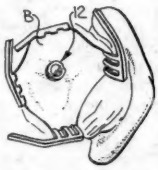
securement means formed and mounted for releasable securement of said reflector means in said deployed condition.

4,612,915

DIRECT BONE CONDUCTION HEARING AID DEVICE

Jack V. D. Hough, Yukon; Gordon L. Richard, Minco, both of Okla.; Kenneth E. Barton, Jr., Jacksonville, Fla.; Paul DiCarlo, Jacksonville, Fla., and Robert Y. Chow, Jacksonville, Fla., assignors to Xomed, Inc., Jacksonville, Fla.

Filed May 23, 1985, Ser. No. 737,188
Int. Cl.⁴ H04R *9/00, 25/00*
U.S. Cl. 128—1 R **20 Claims**



1. A direct bone conduction hearing aid device characterized by increased comfort and aesthetic appearance, said device comprising:

sound processing means for converting sound into an analog electromagnetic signal and including an output transmitter for transmitting the electromagnetic signal and being adapted to be placed supercutaneously on the skull of a hearing impaired person and having first magnetic means therein; and

vibration generating means adapted to be implanted subcutaneously and comprising means for securing said vibration generating means subcutaneously to a skull bone of the hearing impaired person and second magnetic means (1) for cooperating with said first magnetic means to hold said transmitter in position supercutaneously on the skull of the hearing impaired person, (2) for receiving the electromagnetic signal from said transmitter of said sound processing means, and (3) for vibrating the skull bone in response to such electromagnetic signal; whereby, vibrations are generated subcutaneously in response to the analog electromagnetic signal and conducted through the bones of the skull to stimulate the inner ear to create the perception of sound in the hearing impaired person.

4,612,916

METHOD FOR TREATING CASUALTIES IN A CONTAMINATED AREA

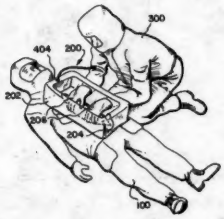
Charles K. Akers, and Roland J. Pilié, both of Williamsville, N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Division of Ser. No. 501,733, Jun. 6, 1983, Pat. No. 4,485,490.
This application Jul. 25, 1984, Ser. No. 634,243
Int. Cl.⁴ A41D *13/00;* **A61F** *13/00*
U.S. Cl. 128—1 R **2 Claims**

1. A method for treating casualties in a contaminated area by

means of an uncontaminated treatment space confined within an enclosure having a sealed observation panel, sealed handling means for permitting manipulation within said treatment space and an access opening closed by first fastener means, said casualties being enclosed within protective garments including second fastener means for permitting access into the interior of said garments, said method comprising the steps of:

placing said enclosure against a protective garment such that said first and second fastener means align with one another;



operating said first and second fastener means to interconnect said enclosure with said protective garment and to communicate said treatment space with the interior of said garment;

utilizing said handling means to contact said casualty while enclosed within said protective garment; and

observing the operations performed within said treatment space and the communicating interior of said protective garment through said observation panel.

4,612,917

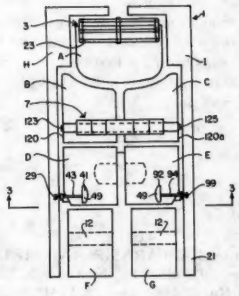
PASSIVE EXERCISE MACHINE

Sylvan W. Kesler, 1821 Greendale, Anchorage, Ak. 99504

Filed Oct. 15, 1984, Ser. No. 660,928

Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—33 **14 Claims**



1. A machine for massaging a patient, comprising:

support means for supporting a patient,

said support means including first and second adjacent buttock supports for supporting the right buttock and the left buttock, respectively, of a patient,

means for intermittently moving said first and second buttock supports toward and away from each other, and

means for intermittently squeezing the hips of a patient, including:

(a) first and second hip-engaging elements for respectively engaging the outside of the patient's body at the left hip and the outside of the patient's body at the right hip, and

(b) means supporting said first hip-engaging element from said first buttock support and said second hip-engaging element from said second buttock support, whereby said first and second hip-engaging elements move toward each other when said first and second buttock supports move toward each other, thus applying a squeezing force to the hips of the patient.

4,612,918

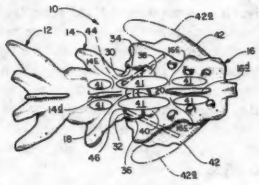
METHOD OF ELIMINATING CANINE CAUDA EQUINA SYNDROME

Barclay Slocum, 241 Spy Glass Dr., Eugene, Oreg. 97401

Filed Oct. 16, 1984, Ser. No. 661,351

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—69 **5 Claims**



1. The method of eliminating canine cauda equina syndrome comprising:

dorsally separating the sacrum from L_7,

substantially aligning the caudal articular processes on L_7 with their respective articular facets on S_1,

by said aligning, relieving pressure on the nerves passing through the L_7S_1 junction,

fixing L_7 relative S_1 with the caudal articular processes on L_7 substantially aligned with their respective articular facets on S_1 by inserting a pin through the articular facet on each caudal articular process on L_7 and through the respective articular facet on S_1, and

fusing L_7 to S_1 by laying bone grafts along the dorsal spinus processes and lamina of L_7 and S_1.

4,612,919

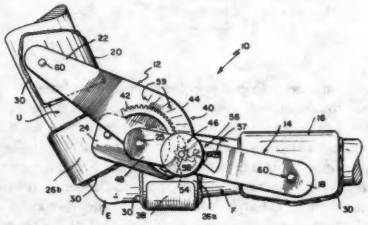
ADJUSTABLE LIMB SUPPORT

Walter E. Best, 8111 Bayberry Ct., Indianapolis, Ind. 46250

Filed Oct. 3, 1984, Ser. No. 657,132

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—77 **14 Claims**



1. An apparatus for adjustably orienting an articulated human limb of a patient in a plurality of therapeutic positions, the human limb having an upper portion and a lower portion, the apparatus comprising

a frame including a rearward frame member and a forward frame member, the forward frame member being mounted for pivotal movement on the rearward frame member,

first receptacle means for embracing at least one of the articulated limb portions in close proximity to a joint uniting the articulated limb portions, the first receptacle

means being mounted on the frame for pivotal movement about a transverse axis orthogonal to the frame,

second receptacle means for embracing one of the upper portion and the lower portion of the articulated limb, the second receptacle means being mounted on the forward frame member for pivotal movement about a second transverse axis orthogonal to the frame,

third receptacle means for embracing the other of the upper portion and the lower portion of the articulated limb, the third receptacle means being mounted on the rearward frame member for pivotal movement about a third transverse axis orthogonal to the frame, and

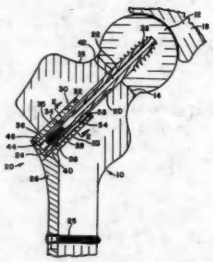
orientation means for adjusting the angular displacement between the forward and rearward frame members to pivot the first, second, and third receptacle means about their respective transverse axes to position the limb received within the first, second, and third receptacle means and therapeutically treat certain muscles in one or both of the articulated human limb portions by causing one of the articulated limb portions received in its companion receptacle means to rotate in relation to the other limb portion received in its companion receptacle means through a selected angle.

4,612,920

COMPRESSION HIP SCREW

Jerry L. Lower, Bourbon, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed Nov. 6, 1984, Ser. No. 668,782
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 BA **12 Claims**



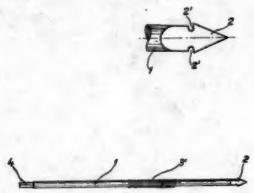
1. A compression hip screw for fixation of a femoral head in a femur, the compression hip screw comprising a plate adapted for attachment to the femur, the plate including a barrel extending into an opening, the opening being formed in the femur and the femoral head, the barrel defining a bore extending therethrough, a first member coupled to the femoral head and extending into the barrel bore, a second member cooperating with the first member to oppose withdrawal of the barrel from the opening, and locking means cooperating with the first member and the barrel to limit rotation between the barrel and the first member, characterized in that the barrel defines an inferior side adjacent the portion of the plate attached to the femur and a superior side remote from the plate portion, the locking means comprising a groove defined in the barrel on the inferior side and a pin disposed in the groove, the pin extending into the barrel bore, and the first member defining a recess for receiving the pin whereby the pin forms an interference fit with the first member and the barrel whereby rotation is limited therebetween.

4,612,921

EXTERNAL FIXATION SYSTEM FOR OSTEOSYNTHESIS

Juan Lazo de Zbikowski, Virgen des la Antigua, 10-1o -Sevilla, Spain

Division of Ser. No. 448,330, Dec. 9, 1982, Pat. No. 4,541,422.
This application Jun. 26, 1985, Ser. No. 748,831
Claims priority, application Spain, Dec. 9, 1981, 507.799
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 A **7 Claims**



1. An improved functional attachment system for osteosynthesis of a fractured bone having a bone fragment on either side of a fracture site of the fractured bone comprising:

at least one elongated transfixion stud for insertion into each bone fragment, having a shaft, one end of said shaft having a spearhead configuration with two planar faces which form cutting edges for penetration of the bone, said spearhead end having a base opposite said cutting edges, said base being wider than a diameter of said shaft, and opposed notches extending between said two planar faces and said shaft;

at least one telescopic bar aligned generally parallel to a longitudinal axis of the fractured bone, having an outer telescopic tubular member and an inner telescopic member slidably inserted into said outer telescopic member, said outer telescopic member having a transverse hole therein for venting air trapped between said telescopic members and for entry of lubricant therebetween, and a fastening pin for insertion into said outer telescopic member hole for restriction of sliding insertion of said inner telescopic member into said outer telescopic member; and

means for holding said transfixion studs and said telescopic bars, said means having articulated joints coupled to said telescopic bars, said joints having jaws for attachment to said transfixion studs.

4,612,922

DRILLING APPARATUS AND METHOD

Forest C. Barber, 2925 Race St., Fort Worth, Tex. 76111

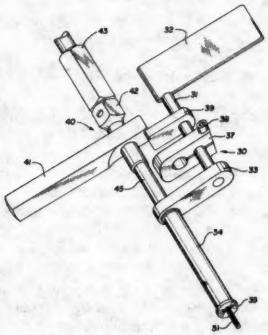
Division of Ser. No. 227,389, Jan. 22, 1981, Pat. No. 4,399,813.
This application Aug. 22, 1983, Ser. No. 525,486
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 EB **14 Claims**

1. Apparatus for manual drilling comprising

a drill assembly including an elongated tubular support, handle means mounted on said tubular support to enable manual support and guiding of said drill assembly, a drill motor mounted at one end of said tubular support having a drive shaft extending therethrough, and drill chuck means mounted at the end of said shaft projecting from said support;

a drill guide dimensioned to receive and guide said tubular support for relative axial and rotational movement, handle

means mounted on said drill guide to enable manual support and guiding thereof;



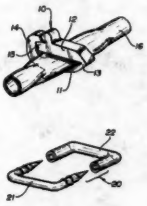
said drill guide and said drill assembly having coacting means for limiting axial movement of said drill assembly relative to said drill guide.

4,612,923

GLASS-FILLED, ABSORBABLE SURGICAL DEVICES

Richard L. Kronenthal, Fair Lawn, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Dec. 1, 1983, Ser. No. 557,038
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 R 9 Claims



1. An absorbable surgical device comprising a synthetic absorbable polymer containing an absorbable glass reinforcing filler in an amount sufficient to increase the stiffness of said polymer.

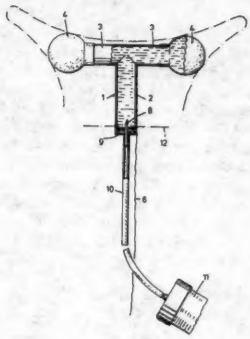
4,612,924

INTRAUTERINE CONTRACEPTIVE DEVICE

Hugo Cimber, Neufeldstrasse 134, 3012 Berne, Canton of Berne, Switzerland

Filed Jul. 9, 1982, Ser. No. 396,656
Claims priority, application Switzerland, Jul. 14, 1981, 4615/81
Int. Cl.[4] A61F 5/47
U.S. Cl. 128—130 3 Claims

1. An intrauterine contraceptive device comprising a hollow support body of stable shape made of stiff but resiliently deformable material, said support body including a central portion and two branch portions projecting laterally from said central portion, and two inflatable members respectively disposed at the ends of said branch portions remote from said central portion, said inflatable members being inflated by introducing a pressure medium into said central portion of said support body and assuming a spherical shape upon inflation within the uterus and being adapted when in operative position



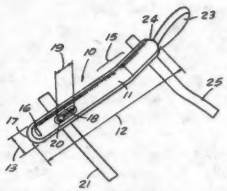
to seal the mouths of the Fallopian tubes without pressure contact between said device and the walls of the uterus proper.

4,612,925

SMALL ANIMAL INTRAVENOUS RESTRAINT SPLINT

William M. Bender, 11126 Balboa Blvd., Granada Hills, Calif. 91344

Filed Jul. 23, 1984, Ser. No. 633,645
Int. Cl.[4] A61F 13/00; A01K 29/00, 15/00
U.S. Cl. 128—133 5 Claims



1. A cat and dog restraint combination comprising:
a longitudinal, thermoplastic splint having a selected length, width, and U-shaped width contour, said splint having a bend in the splint at a length adaptively sized for a selectively sized cat and dog elbow,
a horizontal slot disposed in and across said splint width adjacent a first splint terminus, said slot of sufficient size to accept a pair securing means which secures the end of an animal leg to the said first splint terminus,
a longitudinal slot of selected length disposed in and lengthwise in the splint adjacent said horizontal slot and said first splint terminus,
a restraint pin slidably permanently disposed in said longitudinal slot,
a first restraining flexible strap secured to said restraining pin, having a selected length and width, said first strap disposed normal to said splint and secured to aforesaid slidable restraint pin,
a flat paddle having a selected size disposed and terminally secured adjacent a second splint terminus and integral therewith and having a paddle face disposed normal to the width of said splint,
said paddle aligned with a longitudinal axis of said splint, said paddle adapted to receive a second securing means which secures said paddle to an animal torso, which also immobilizes said splint and leg relative to the animal torso, and,
a second restraining flexible strap normally secured to said

splint, said strap having a selected length and width, said strap disposed on said splint between said paddle and said bend in said splint.

4,612,926

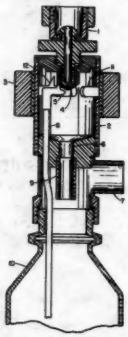
DUAL-RANGE ASPIRATOR DEVICE

Anthony A. Boiarski, Columbus, Ohio; Barbara H. Fleck, Randolph, Vt.; Eugene J. Meierhoefer, Hackettstown, N.J., and Richard Razgaitis, Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 659,937, Oct. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 515,828, Jul. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 401,263, Jul. 23, 1982, abandoned. This application Oct. 11, 1985, Ser. No. 786,554

Int. Cl.[4] A61M *11/02*

U.S. Cl. 128—200.21 4 Claims



1. An aspirator device for supplying up to at least about 40 liters/minute of an oxygen/air mixture having a selectable oxygen concentration of from less than about 30% up to 100%, said device comprising:

(A) a body member having walls defining a generally cylindrical chamber and at least one air inlet extending through a wall of said chamber, said air inlet communicating at one end with the atmosphere surrounding said body member and at the opposed end with said chamber, said walls of said body member also defining a gas outlet adjacent one end of said chamber and through which gas can leave said chamber;

(B) an oxygen flow controller for admitting oxygen as an oxygen stream into said chamber, said oxygen flow controller comprising a first nozzle having a first orifice opening into said chamber remote from said gas outlet, said first orifice being disposed adjacent said air inlet and arranged to continuously deliver an oxygen stream at a low flow rate into said cylindrical chamber subtantially parallel to the axis thereof so as to aspirate air through said air inlet into said cylindrical chamber, thereby forming said oxygen/air mixture within said chamber and causing said mixture to leave said chamber via said gas outlet, said oxygen flow controller further comprising a separate second nozzle adjacent said first nozzle and having a second orifice, and valve means for varying the rate of flow of oxygen through said second orifice, said second orifice opening into said chamber so that, when it is open, the rate of flow of oxygen into said chamber is increased;

(C) a slip-ring closure surrounding said chamber and moveable relative to said air inlet so that said slip-ring closure can be disposed to leave open, partially close or fully close said air inlet, thereby controlling the rate of aspiration of air through said air inlet into said chamber and hence the concentration of oxygen in said oxygen/air mixture;

(D) a liquid bottle separate from said integers (A), (B) and (C) and having first and second openings, said liquid bottle being secured to said body member so that said first opening is disposed adjacent said gas outlet in said body member so that said oxygen/air mixture leaving said chamber via said gas outlet will pass through said first opening into said liquid bottle and will leave said liquid bottle via said second opening;

(E) a lift tube for delivering liquid from said bottle, said lift tube having at its one end a liquid inlet disposed within said bottle and at its opposed end a liquid outlet;

(F) a liquid nozzle having a liquid inlet connected to said liquid outlet of said lift tube, an outlet orifice and walls defining a liquid conduit connecting said liquid inlet of said nozzle to said outlet orifice thereof, said liquid orifice being disposed within said chamber adjacent said first orifice of said oxygen flow controller and between said first orifice and said gas outlet, such that said oxygen stream delivered by said first orifice of said oxygen flow controller into said chamber will flow past said liquid orifice of said liquid nozzle, thereby creating suction in said liquid nozzle, drawing liquid from said bottle via said lift tube and said liquid nozzle in said chamber, and incorporating the liquid in droplet form into said oxygen/air mixture; and

(G) deflector means downstream of said second orifice for directing the oxygen flow therethrough away from said oxygen stream delivered by said first orifice such that said oxygen stream delivered by said first orifice is not diverted from drawing liquid from said bottle via said lift tube and said liquid nozzle.

4,612,927

INSTRUMENT FOR KEEPING CLEAR THE UPPER RESPIRATORY PASSAGES

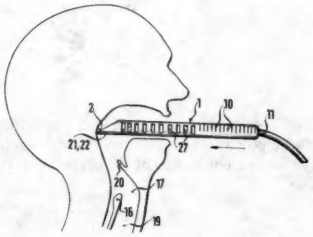
Christian Krüger, Curtiusstrasse 4, 2400 Lübeck, Fed. Rep. of Germany

Filed Jan. 8, 1985, Ser. No. 689,662

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400872

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—200.26 1 Claim



1. In an instrument for keeping clear the upper respiratory passages and for performing intubations, comprising a shaft with a passage to enable a tube to be inserted with its distal extremity moving as far as into the trachea with said passage acting as a guide, an improvement characterized in that the passage is constructed as a channel extending within the shaft of the instrument and the distal extremity of the instrument comprises a head before which terminates the said channel and which at the time of inserting the instrument is to be placed in contact wit the larynx and acts as a stop to limit the maximum distance of insertion, including a ramp formed at the distal extremity of the channel, the surface of said ramp rising from the bottom of the channel, and wherein said head comprises two mutually overlapping flaps which are flexibly displaceable rearwards upon coming into contact with the larynx, and wherein the proximal extremities of the flaps lie in the exten-

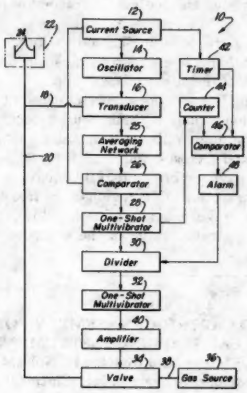
sion of the ramp surface and form a centering guide for a tube to be pushed over the ramp in the distal direction.

4,612,928

METHOD AND APPARATUS FOR SUPPLYING A GAS TO A BODY

Brian L. Tiep, 632 Normbega Dr., Monrovia, Calif. 91016; Robert E. Phillips, 12217 Iredell St., Studio City, Calif. 91601, and Ben A. Otsap, 7661 Airport Blvd., Los Angeles, Calif. 90045

Filed Aug. 28, 1984, Ser. No. 645,050
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.23 12 Claims



1. A process of delivering a gas to an entrance into the pulmonary tract of a patient during breathing in which the gas is placed in a location where it will be inhaled during the inhalation part of the breathing cycle in which the improvement comprises:

obtaining a series of repetitive electric signals of varying amplitude from a series of uniform repetitive pulses, said signals of varying amplitude corresponding to the breathing rate of the patient, said series of signals of varying amplitude being obtained by using a variable capacitor transducer means capable of being activated by the spontaneous breathing of the patient where it can be so activated and using the spontaneous breathing of the patient to so activate said transducer means, the variations between said signals of varying amplitudes corresponding to various inhalation/exhalation intervals during the breathing cycle,

selecting periodic signals of said series of signals of varying amplitude corresponding to inhalation intervals so as to create another series of signals, and

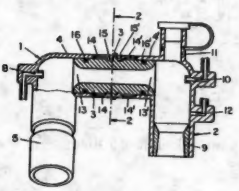
using said signals of said other series to cause release of said gas at about the start of said inhalation portion of said breathing cycle to said location so that said released gas will be inhaled at about the start of said inhalation part of said breathing cycle.

4,612,929

ATTACHMENT FOR THE SUPPLY OF BREATHING GAS FOR HIGH-FREQUENCY ARTIFICIAL RESPIRATION

Ernst W. Schübert, Lubeck, and Peter Gebhardt, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 693,014
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401924
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.25 4 Claims



1. An attachment for supplying breathing gas to a patient during high-frequency artificial respiration, comprising a central tubular flow part having opposite open ends and defining oppositely extending collecting nozzles therein, a ring conduit part having a first tubular portion mounted over a portion of said tubular flow part adjacent its one end thereof, said ring port having an opposite tubular end portion divided into a supply connection adapted to be connected to a respiratory gas supply conduit and a discharge connection adapted to be connected to a delivery conduit, said supply and discharge connections each being rotatably connected over said opposite tubular end portion, a patient connection tube having a first tubular end portion mounted over the opposite end of said central tubular flow part and an opposite tubular end portion adapted to be connected to a patient's respiratory system, a first injector nozzle for breathing gas connected into said ring conduit part and directed toward and in alignment with the collecting nozzle in said central tubular flow part, and a second injector nozzle for breathing gas connected into said patient connection tube and directed toward and in alignment with the collecting nozzle in said central tubular flow part such that said first and second nozzles are directed toward each other; and said central tubular flow part having a pair of annular grooves on the outer surface thereof, said first tubular end portions of said ring conduit part and patient connection tube each having snap arms extending therefrom and each engaged in one of said annular grooves.

4,612,930

HEAD FIXATION APPARATUS INCLUDING CROWN AND SKULL PIN

Paul W. Bremer, 433 Margaret St., Jacksonville, Fla. 32204

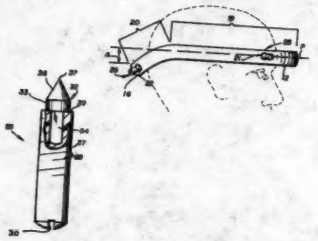
Filed Mar. 19, 1985, Ser. No. 713,552
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 B 20 Claims

1. A skull pin comprising:

an exteriorly threaded elongated cylinder of plastic, having first and second ends; and

a skull-engaging portion connected to said cylinder and

extending outwardly from said first end thereof, and terminating in a pointed tip, said skull engaging portion of a



material which does not artifact significantly more than bone does.

4,612,931

INSTRUMENT FOR EXTRACTING FOREIGN BODIES FROM PHYSIOLOGICAL CANALS OR DUCTS IN THE HUMAN BODY

Enrico Dormia, I-Lecco, Italy, assignor to Societe Anonyme: Synthelabo, Paris, France

Filed Jul. 22, 1985, Ser. No. 757,300

Claims priority, application Italy, Jul. 20, 1984, 21982 A/84

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—328 **7 Claims**

1. In an instrument for extracting foreign bodies from physiological canals or ducts in the human body, comprising a tube or catheter containing a control cable in turn supporting a basket or cage formed by elastic wires,

(a) said basket constitutes an outer spacer basket and it contains therewithin an inner extracting basket shaped in similar manner;

(b) the inner extracting basket is connected by its proximal end to the proximal end of the spacer basket and the distal end of the inner extracting basket is independent and spaced apart from the distal end of the outer spacer basket; and

(c) between the inner extracting basket and the outer spacer basket is defined an intermediate volume adapted to contain the rough edges or protuberances of the foreign bodies to be extracted.

4,612,932

MAGAZINE FOR C-SHAPED SCALP CLIPS

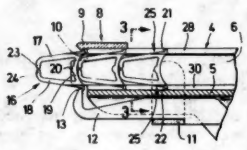
Wolfhard Caspar, Bad Homburg; Theodor Lutze, Balgheim, and Karl-Ernst Kienzle, Immendingen, all of Fed. Rep. of Germany, assignors to Aesculap-Werke AG vormals Jetter & Scheerer, Tuttlingen, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,267

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3335985

Int. Cl.[4] A61B *17/10*

U.S. Cl. 128—334 R **3 Claims**



1. In combination, C-shaped scalp clips and a magazine for receiving C-shaped scalp clips each of said scalp clips having legs connected via a bridge and with facing clamping jaws at their free ends,

said scalp clips being arranged one behind the other in the magazine such that the free ends of one scalp clip rest against the bridge of the adjacent scalp clip,

said scalp clips having laterally open recesses in their bridges including the regions where legs and bridge meet,

said magazine having guide rails extending along its length and engaging in said recesses, and

each said scalp clip having a bridge that is concave in shape and a convex cross section in the region of the free ends of its legs so that the convex portions of each following scalp clip engages the concave bridge of the preceding scalp clip.

4,612,933

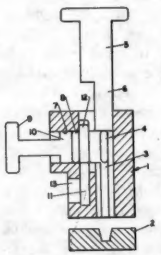
MULTIPLE-LOAD CARTRIDGE ASSEMBLY FOR A LINEAR SURGICAL STAPLING INSTRUMENT

Ronald J. Brinkerhoff, Moscow, and Rudolph H. Nobis, Cincinnati, both of Ohio, assignors to Senmed, Inc., Cincinnati, Ohio

Filed Mar. 30, 1984, Ser. No. 595,291

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 R **50 Claims**



1. A surgical stapling instrument for implanting at least one linear row of staples in tissue, comprising:

anvil means;

means for driving staples aginst said anvil means;

a first linear array of staples located in a first position within said instrument aligned between said driving means and said anvil means;

at least a second linear array of staples located in a second

position within said instrument out of alignment with said driving means and said anvil means;

means for actuating said driving means to move said first linear array of staples from said first position and clinch said first array of staples against said anvil means; and

means for transferring said second array of staples from said second position to said first position after a first operation of said actuating means to enable a second operation of said actuating means.

4,612,934

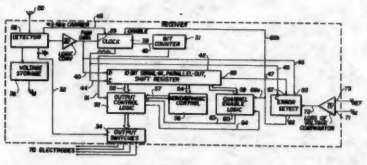
NON-INVASIVE MULTIPROGRAMMABLE TISSUE STIMULATOR

William N. Borkan, 3364 NE. 167th St., N. Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 278,991, Jun. 30, 1981, Pat. No. 4,459,989. This application Jul. 16, 1984, Ser. No. 631,299

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—421 **9 Claims**



1. An electronic tissue stimulator system, comprising:

at least three electrodes to be implanted adjacent tissue to be stimulated in a patient;

transmitting means for transmitting programming data to define for each of said electrodes to a positive, negative or high impedance state;

receiving means to be surgically implanted within said patient for receiving said programming data, for generating stimulation pulses and for delivering said stimulation pulses to said electrodes having positive and negative states as defined by said programming data;

means for automatically measuring physical parameters; and

means for modifying said programming data as a function of said sensed parameters.

4,612,935

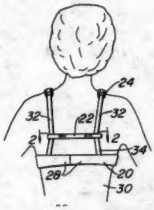
COMFORT ACCESSORIES FOR BRASSIERES

Claire R. Greifer, 217 E. Sedgwick St., Philadelphia, Pa. 19119

Filed Oct. 16, 1984, Ser. No. 661,506

Int. Cl.[4] A41D *27/10;* **A41C** *3/06*

U.S. Cl. 128—510 **6 Claims**



1. In combination with the conventional brassiere having a pair of shoulder straps each having a front and rear portion, the improvement comprising strap adjusting means, said strap adjusting means being arranged for adjusting the position of at least one of said shoulder straps with respect to the wearer's shoulders and comprising a non-elastic elongated flexible strip having loop means located at each end thereof, said strip being arranged for mounting on either the front or rear portions of both of said shoulder straps, with each of said loop means extending about and holding said front or rear portion of both of said shoulder straps, said strip also being arranged for mounting on the front and rear portions of one of said shoulder straps and extending under the wearer's arm, both ends of said loop means extending about and holding said rear portion of one of said straps and the other of said loop means extending about and holding the front portion of said one shoulder strap, the length of said strip being adjustable, whereupon the position of the associated shoulder strap can be adjusted to any desired position with respect to said shoulder.

4,612,936

CLIP-TYPE ELECTRODE FOR ELECTROCARDIOGRAPHS

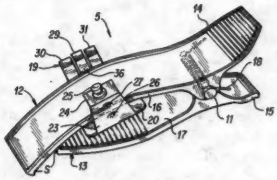
Kimio Yamaguchi, Tokyo, and Yoshinori Chiba, Kashiwa, both of Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 644,902

Claims priority, application Japan, Apr. 12, 1984, 59-54009[U]

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—644 **4 Claims**



1. A clip-type electrode for an electrocardiograph comprising:

a pair of clamping plates arranged to be opened and closed relative to each other about a common shaft extending laterally therebetween, said clamping plates having concave surfaces facing each other,

an electrode member mounted on one of said clamping plates, and a spring means coiled around said common shaft and arranged to bias ends of said clamping plates remote from said common shaft towards each other, one of said clamping plates being longer than the other,

said electrode member being formed of an electrically conductive resilient material and including a pressure plate section for pressing a limb of a living body, and a pair of engagement plates each extending upwardly from opposing edges of said pressure plate section and having plural inwardly projecting bosses,

said engagement plates clamping opposing longitudinal edges of the longer one of said clamping plates for attaching said electrode member to said last-mentioned clamping plate.

4,612,937

ULTRASOUND DIAGNOSTIC APPARATUS

Lawrence R. Miller, Sacramento, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Dec. 16, 1985, Ser. No. 809,363

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—663 **9 Claims**

1. An ultrasound diagnostic apparatus for mapping blood flow in a body, comprising:

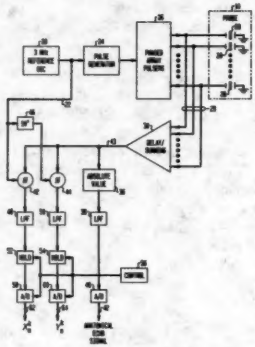
ultrasonic transmitting means for transmitting a series of temporally spaced ultrasound bursts toward a region where blood flow is to be measured, a number N of said bursts being directed along each of a plurality of beam directions in a scanning plane, where N is an integer from 4 to 8;

ultrasound receiving means for receiving ultrasound re-

flected from the blood in response to said ultrasound bursts;

detecting means for comparing said transmitted ultrasound bursts and said received ultrasound and producing a set of Doppler frequency data (X_n^k, Y_n^k) associated with each of said transmitted bursts in response to said comparison;

processing means for generating a velocity estimator value V^k representing blood flow velocity at each of several



locations, with each of said velocity estimator values along a specific one of said beam directions being generated utilizing said sets of Doppler frequency data (X_n^k, Y_n^k) produced from said number N of ultrasound bursts; and

display means for displaying an image of said blood flow in response to said velocity estimator value V^k at said several blood locations.

4,612,938

METHOD FOR ILLUMINATING CAVITIES

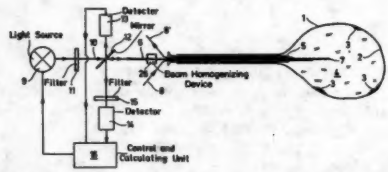
Ralph Dietrich; Dieter Jocham, both of Munich; Eberhard Unsöld, Oberschleissheim; Wolfram Weinsheimer, and Wolfram Gorisch, both of Munich, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung mbH, München, Neuherberg, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,853

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 3232912; Jun. 29, 1983, 3323365

Int. Cl.[4] A61B *6/00*

U.S. Cl. 128—665 **16 Claims**



1. A method for the uniform and simultaneous illumination of the interior surface of a cavity by means of radiation for the purpose of observation and/or treatment of the interior surface, comprising the steps of: filling the interior of a cavity, at least in part, with a liquid radiation dispersing medium, and introducing light radiation of a suitable wavelength into said liquid dispersing medium to cause same to substantially uniformly scatter said radition to illuminate said interior surface.

4,612,939

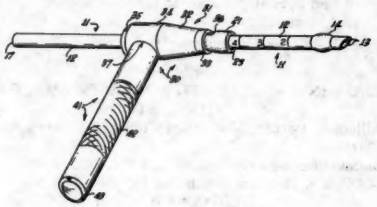
METHOD FOR DIAGNOSIS OF STRESS INCONTINENCE IN WOMEN

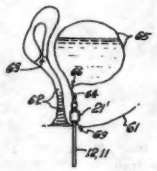
Jack R. Robertson, 1451 Refugio Rd., Santa Ynez, Calif. 93460

Filed Oct. 15, 1984, Ser. No. 661,087

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—774 **11 Claims**





1. A method for diagnosis of incontinence in a woman by investigating movement of liquid from her bladder to her urethra, comprising the steps of:

positioning a tube partly within such urethra, with the proximal end of the tube at least slightly withdrawn from such bladder and the distal end of the tube extending outwardly through such urethra to the outside of such woman's body;

anchoring the tube, in the position described, by anchoring means positioned within such woman's body:

while the tube is so disposed, causing the woman to undergo stress of a type which induces such incontinence; and

observing the timing of discharge of such liquid relative to incidence of the stress.

4,612,940

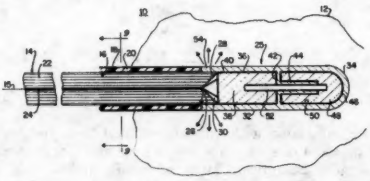
MICROWAVE DIPOLE PROBE FOR IN VIVO LOCALIZED HYPERTHERMIA

Raymond S. Kasevich, Weston; Arthur S. Dwyer, Braintree, and Bart G. Guerreri, Framingham, all of Mass., assignors to SCD Incorporated, Westborough, Mass.

Filed May 9, 1984, Ser. No. 608,565

Int. Cl.[4] A61N *5/02*

U.S. Cl. 128—804 **23 Claims**



1. A microwave dipole probe for localized hyperthermia of an in vivo target volume, comprising:

an outer conductor;

an inner conductor extending through and beyound said outer conductor, the portion of said inner conductor extending beyond said outer conductor being expanded in diameter relative to the portion within said outer conductor; and

a dielectrically loaded phase reversal sleeve folded over the outside of said outer conductor and containing a dielectric loading material similar to the dielectric constant of the in vivo target volume.

4,612,941

COMBINE HARVESTER STRAW CHOPPER STATIONARY KNIFE ADJUSTMENT

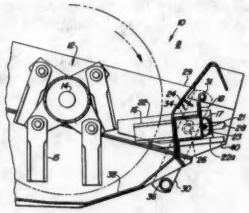
Detlev Kunde, Homburg, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jul. 15, 1985, Ser. No. 755,409

Claims priority, application European Pat. Off., Jul. 19, 1984, 84108528.5

Int. Cl.[4] A01D *41/12, 89/00*

U.S. Cl. 130—27 R **9 Claims**



1. In a combine harvester for harvesting grain crop material, having means for processing the material and dividing it into grain, straw and chaff fractions, and having a body and means for receiving, conveying and discharging the straw fraction, and a straw chopper having an inlet in a crop material receiving relationship with the discharged straw fraction, the straw chopper including a transverse rotor rotatable about a generally transverse axis and having generally radially extending spaced apart blades, and a transverse array of stationary elements extending generally radially towards the chopper rotor axis and disposable to radially overlap the blades of the rotor, an adjustment arrangement for selectively varying said radial overlap comprising:

a pair of transversely spaced linear first guide surfaces carried by the combine body, extending generally radially with respect to the chopper rotor axis;

a transversely extending carrier for supporting the stationary elements in transversely spaced array, extending substantially parallel to the rotor axis, the carrier including a pair of transversely opposite ends, each end including at least one generally longitudinally extending guide surface for mating with the guide surfaces of the combine body and an adjustment lever connecting means;

an adjustment lever including a pivot end pivotably attached to the combine body for pivoting about a fixed generally transverse pivot axis and an opposite handle end and an intermediate carrier engaging portion for engaging the adjustment lever connecting means of the carrier, the lever being swingable fore-and-aft in a generally upright plane for slidably adjusting the stationary knife carrier fore-and-aft, said slidle adjustment being defined and controlled by the mating guide surfaces; and

clamping means effective between the carrier and the combine body operable to secure the knife carrier in a selected position.

4,612,942

FLAVOR ENHANCING AND MODIFYING MATERIALS

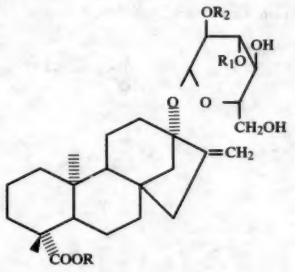
Robert H. Dobberstein, Wheaton, and Fred K. Suzuki, Arlington Heights, both of Ill., assignors to Stevia Company, Inc., Arlington Heights, Ill.

Filed Mar. 8, 1984, Ser. No. 587,599

Int. Cl.[4] A24B *3/12, 15/34*

U.S. Cl. 131—276 **36 Claims**

1. An orally consumable composition having a modified or enhanced flavor comprising an effective amount of a diterpene glycoside, wherein said amount of diterpene glycoside is less than the sweetness threshold level of the diterpene glycoside in the orally consumable composition, said diterpene glycoside having the structure:



wherein R, R_1 and R_2 are selected from the group consisting of H, glucose, rhamnose and beta-sophorose.

4,612,943

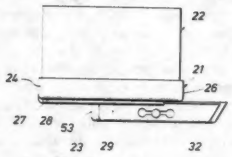
DISPENSER FOR SNUFF AND THE LIKE

Larry J. Meinkowsky, Rte. 5, Box 582, Hallettsville, Tex. 77964

Filed Aug. 5, 1983, Ser. No. 520,835

Int. Cl.[4] A24F *47/00*

U.S. Cl. 131—329 **10 Claims**



1. A dispenser for metering doses of a pulverulent material from an open end of a container to a user, the dispenser comprising:

(a) a cap adapted to be mounted upon the open end of the container by an upstanding rim;

(b) said cap having a flat base with parallel guides and a passage between said guides to the open end of the container;

(c) an elongated spoon slide mounted in said guides to reciprocate laterally across said flat base between closed and delivery positions;

(d) a valve tongue mounted in said spoon slide such that a first side of the tongue forms a transverse divider defining a chamber at one end of the slide for measuring a dose of the material and such that a second side of the tongue forms a gate for closing off the passage in the base, said valve tongue being aligned in the spoon slide relative to the passage in the flat base of the cap and the rim of the cap such that

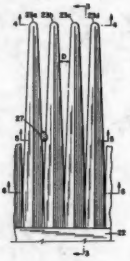
(1) when the slide is reciprocated laterally to the slide-delivery position, the gate side of the tongue moves to

a gate-closed position where the gate covers and closes off the cap passage so that no material can emerge from the container through the passage and where the slide chamber is exposed beyond the rim of the cap for a delivery of a dose of the material to the user, and (2) when the slide is reciprocated laterally to the slide-closed position, the gate side of the tongue moves to a gate-open position where the gate does not cover and close off the cap passage and where the slide chamber is positioned over the cap passage so that material can emerge from the container through the passage to fill the slide chamber.

4,612,944
COMB

Frank Bachrach, Great Neck, N.Y., and James M. Teale, Woodcliff Lake, N.J., assignors to American Comb Corporation, Paterson, N.J.

Filed Feb. 20, 1985, Ser. No. 703,429
Int. Cl.[4] A45D *24/00*
U.S. Cl. 132—11 R **9 Claims**

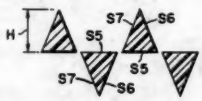


1. A comb for removing lice and nits from hair comprising a base, a plurality of teeth extending substantially in the same direction away from the base, the longitudinal axis of each tooth being parallel to the longitudinal axis of each other tooth and substantially the same length, each said tooth having a polygonal cross sectional shape, the sides of each such cross sectional polygon increasing in length from the free end of each tooth toward the base, so that the spacing between adjacent teeth narrows toward said base, each of the sides of each cross sectional shape of each tooth converging at a rounded top of each tooth, said rounded top having a cord smaller in length than the width of said tooth at any point along its length, said polygonal cross sectional shape being diamond shaped so that said teeth form a four sided pyramid, the side walls of each diamond shaped tooth meeting to form an edge at the intersection thereof, said teeth being arranged on said base so that two opposite edges of each tooth lie in a plane passing through the corresponding opposite edges of each other tooth.

4,612,945
COMB

Frank Bachrach, Great Neck, N.Y., assignor to American Comb Corporation, Paterson, N.J.

Filed Feb. 20, 1985, Ser. No. 703,428
Int. Cl.[4] A45D *24/30*
U.S. Cl. 132—137 **5 Claims**

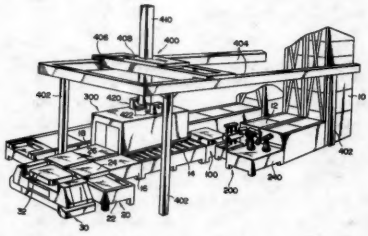


1. A comb for removing lice and nits from hair comprising a base, a plurality of teeth extending substantially in the same direction away from the base, the longitudinal axis of each tooth being parallel to the longitudinal axis of each other tooth and substantially the same length, each said tooth having a triangular cross sectional shape forming a three sided pyramid, the sides of each such cross sectional triangle increasing in length from the free end of each tooth toward the base, so that the spacing between adjacent teeth narrows toward said base, the cross sectional triangle of each tooth having a base side and an apex opposite said base side, the base side of each cross sectional triangle of each tooth lying along the same line when the cross sectional plane of one tooth passes through each other tooth, each of the sides of said cross sectional shape of each tooth converging at a rounded top of each tooth, and the side walls of each triangular shaped tooth meet to form an edge at the intersection thereof, said teeth being arranged on said base so that said edge of each tooth which forms said apex of said cross sectional triangle extends in a direction opposite to the apex of the cross sectional triangle of each adjacent tooth.

4,612,946
AUTOMATIC SET-UP SYSTEM

Akihiko Noh, Chigasaki; Yoshiaki Saijo, Yokohama; Shinichi Sato, Kawasaki, and Ichiro Tanaka, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 581,417, Feb. 17, 1984, Pat. No. 4,543,970. This application Jun. 14, 1985, Ser. No. 744,698
Claims priority, application Japan, Feb. 21, 1983, 58-26236; Oct. 18, 1983, 58-195073; Oct. 18, 1983, 58-195076
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—62 **2 Claims**



1. An automatic set-up system for setting up a work to be processed by a flexible manufacturing system automatic machine tool, comprising:

a pallet on which said work is mounted;

a setting table on which said pallet having said work thereon is placed;

a convey unit having grip means for sequentially gripping and conveying said pallet and the work onto said setting table;

a clamp mounted on said pallet to clamp and fix the work on said pallet;

a cleaner for cleaning the work and said pallet which are fixed together by said clamp;

feeding means for delivering the work and said pallet which are fixed together by said clamp to the automatic machine tool and for feeding a processed work and said pallet to said cleaner; and

an index device including,

a base having a horizontal upper surface,

an X table capable of moving in an X direction along the upper surface of said base,

a Y table capable of moving relative to said X table in a Y direction perpendicular to the X direction,

a θ table capable of rotating relative to said Y table, said pallet or the work being placed on said θ table,

two X position detectors for detecting X positions along side surfaces of said pallet or the work placed on said θ table, said X position detectors being arranged to be spaced apart from each other along the Y direction,

a Y position detector for detecting a position of said pallet or the work placed on said θ table along the side surface of said pallet or the work, and

position adjusting means for moving said X, Y and θ tables such that a deviation falls within an allowable range when the positions in the X and Y directions, which are detected by said X position detectors and said Y position detector, fall outside the allowable range, the work and said pallet being placed by said convey unit on said θ table and being further conveyed by said convey unit onto said setting table after the deviation falls within the allowable range.

4,612,947

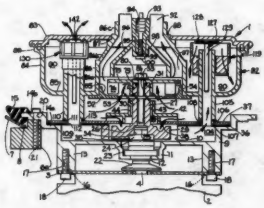
APPARATUS FOR REMOVING SOIL FROM THE WASH AND RINSE WATERS OF AN AUTOMATIC DISHWASHER

Thomas W. Duncan, Connersville, Ind., assignor to Design & Manufacturing Corporation, Connersville, Ind.

Filed May 31, 1985, Ser. No. 739,975

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—104 **19 Claims**



1. Filter apparatus for removing soil from the wash and rinse waters of ar automatic dishwasher of the type capable of cycles having wash, rinse, and drain operations, and of the type having a vat, a drain for said vat and spray means within said vat, said filter apparatus comprising a water pump and an annular container having a bottom, an inner wall, an outer wall and a top defining an annular separation chamber, said pump having a water inlet adjacent the bottom of said vat and a first outlet connected to said spray means, said pump having a second outlet, said separation chamber having a wash and rinse waters inlet connected to said second pump outlet, said separation chamber wash and rinse waters inlet having a check valve permitting water to flow only from said wash and rinse waters inlet into said separation chamber, said pump having a third pump outlet, said chamber having a drain water inlet connected to said third pump outlet, said chamber having a wash and rinse waters outlet means to return said wash and rinse waters to said vat, said chamber having a drain water outlet connected to said drain, a bidirectional motor connected to said pump, said motor being energizable in a first direction during said wash and rinse operations to cause said pump to pump a portion of said wash and rinse waters from said vat through said first pump outlet to said spray means and a portion of said wash and rinse waters through said second pump outlet and said separation chamber wash and rinse water inlet into and through said separation chamber to said wash and rinse water outlet means thereof, said motor being energizable in a second direction during a drain operation to cause said pump to pump water from said vat through said third pump outlet and said separation chamber drain water inlet into and through said separation chamber to said drain water outlet thereof, whereby soil from said wash and rinse waters is trapped within said separation chamber by sedimentation during said wash and rinse operations, and said soil is flushed from said separation chamber to drain during said drain operation.

4,612,948

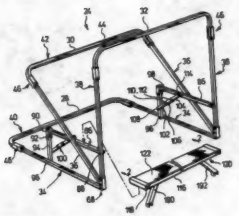
PORTABLE SHELTER OR TENT ENCLOSURE, STRUCTURES AND COMPONENTS THEREFOR

David Simpson, Concord, Canada, assignor to Insta-Hut Inc., Concord, Canada

Filed Dec. 24, 1984, Ser. No. 685,555

Int. Cl.[4] E04H *15/48, 15/58, 15/00, 15/02*

U.S. Cl. 135—112 **7 Claims**



1. A portable shelter or tent enclosure comprising a pivotally collapsable self-supporting frame for supporting a fabric cover comprising a pivotally collapsable self-supporting frame having at least three substantially U-shaped frame members, each substantially U-shaped frame member having a pair of parallel side arms spaced from each other at the same end by a top arm, the three pairs of parallel side arms each at the end remote the top arm linked to about a common point, at least two of the three pairs of parallel side arms each at the end remote the top arm pivotally linked to the about common point sufficient to permit at least two of the three substantially U-shaped frame members to be pivotally spaceable so as to permit the three substantially U-shaped frame members to be angularly spaced apart one from the other, at least two of the three substantially U-shaped frame members braceable when angularly spaced one from the other by a pair of releasable locking means each one comprising a horizontal locking segment pivotally attached at one end to an intermediate point along one side arm, a second locking segment pivotally attached at one end to an intermediate point along a sidearm angularly spaceable from the other side arm, each of the two locking segments at the end opposite that which is linked to the side arms pivotally linked one to the other, the horizontal locking segment and second locking segment braceable in an angularly spaced position so as to form a parallelogram laterally braced when the frame is erected by a diagonal locking segment extending angularly downwardly between the horizontal locking segment and the second locking segment, the diagonal locking segment composed of two subsegments each one attached pivotally at one end to one locking segment and at the other end pivotally connected one to the other, and; the pair of parallel side arms of each of at least two of the three frame members laterally braced apart by a removably securable horizontal frame member extending between each horizontal locking segment of the pair of releasable locking means, the removably securable horizontal frame member carrying two lateral support arms each one connected at one end to an intermediate point along the removably securable horizontal frame member and extending angularly downwardly to the side each one to surmount at the opposite end one of the two side arms of a substantially U-shaped frame member.

4,612,949

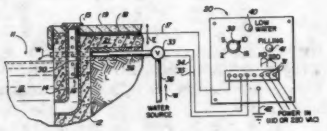
APPARATUS FOR CONTROLLING WATER LEVEL

James H. Henson, 1431 E. Air Libre, Phoenix, Ariz. 85022

Filed Feb. 11, 1985, Ser. No. 700,470

Int. Cl.[4] F16K *21/18*; F17D *3/00*

U.S. Cl. 137—2 **2 Claims**



1. Apparatus for adding fluid to a reservoir, said reservoir normally being filled to a desired level therein, said apparatus including

(a) a probe having a fluid sensing tip generally maintained in fixed position above said reservoir such that

(i) said sensing tip contacts the fluid when said reservoir is filled to said desired level therein, and

(ii) said sensing tip is spaced above the fluid when said reservoir is filled to a level lower than said desired level of fluid therein;

(b) a control unit in communication with said probe to monitor

(i) when said sensing tip is contacting fluid in said reservoir, and

(ii) when said sensing tip is spaced away from and not contacting fluid in said reservoir, said control unit including timing means for determining the amount of time since said sensing tip has last contacted fluid in said reservoir;

(c) a conduit through which fluid flows into said reservoir; and,

(d) a valve operatively associated with said control unit and positioned in said conduit, said valve having at least two operative positions,

(i) a normally closed position in which fluid is prevented from passing through said conduit into said reservoir, and

(ii) an open position in which fluid flows through said conduit into said reservoir,

said control unit

determining when said amount of time determined by said timing means is equivalent to a preselected period of time, and

when said fluid sensing tip has not contacted said fluid for said preselected period of time, moving said valve to said open position to permit fluid to flow through said conduit into said reservoir when said sensing tip of said probe is spaced away from and not contacting fluid in said reservoir, if the amount of time since said sensing tip has last contacted said fluid is less than said preselected period of time due to said fluid contacting said sensing tip, not moving said valve to said open position.

4,612,950

PRESSURE MEASURING AND REGULATING DEVICE

Erich Schmid-Welti, Langwiesen, Switzerland, assignor to Schmid-Welti AG, Langwiesen, Switzerland

Filed Mar. 13, 1985, Ser. No. 711,379

Claims priority, application Switzerland, Mar. 13, 1984, 1256/84

Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—116.5 **17 Claims**

1. A pressure metering and regulating device comprising:

a case formed by a unitary block; and,

at least one pressure regulator positioned in said case and comprising:

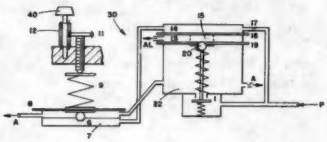
a line pressure supply line,

a regulated pressure issue line,

an outlet line,

manually operated control means for adjusting a regulated pressure setting, and

first and second interconnected valve chambers recessed into said block, said first valve chamber being a regulator chamber connected with one of the line pressure supply line and the outlet line, depending on the setting of said



manually operated control means, said second valve chamber being a control chamber operable connected to said manually operated control means for adjusting said regulated pressure, wherein said valve chambers of said pressure regulator are positioned side by side in said case to attain less overall height and wherein said line pressure supply line is in fluid contact with the regulator chamber and said issue line is in fluid contact with one of the control chamber and the regulator chamber.

4,612,951

WATER-STORAGE RESERVOIR

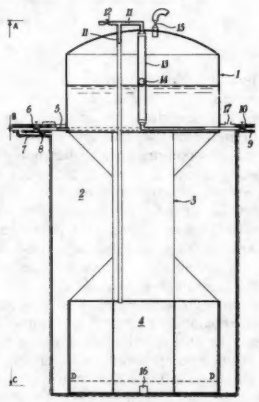
Fabio Desogus, 09100 Cagliari, (Pirri) Sardegna, Italy

Filed Jul. 9, 1985, Ser. No. 753,073

Claims priority, application Italy, Jul. 13, 1984, 48563 A/84

Int. Cl.[4] E03B *11/14*; B67D *5/54*

U.S. Cl. 137—209 **13 Claims**



1. A water-storage reservoir, prevailingly underground, comprising a first reservoir provided above the ground level and connected to water feeding and distribution means, an underground tank which is also connected to said water feeding means, a second reservoir provided inside said tank and on the bottom of the same and connected to said tank through opening means, a first pipe connecting the tops of said first and second reservoirs, a second pipe whose ends have a frustum shape and having upper and lower side feeding holes, said second pipe connecting internally the lower end of the first reservoir with said water distribution means, floating means provided inside said second pipe for closing said upper or lower holes of said second pipe when said first reservoir is respectively full or empty, and gate valve means provided on

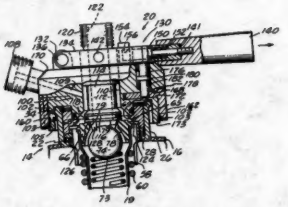
said feeding means to the first reservoir and to the tank, as well as on said first pipe and said distribution means, the pressure of the water columns in series in the first reservoir and second reservoir and in said tank by means of said first and second pipe and of said opening means always being lower then the water feeding pressure.

4,612,952

VALVE ASSEMBLY AND COUPLER THEREFOR

Merton R. Fallon, Thousand Oaks, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Filed Feb. 25, 1985, Ser. No. 705,439
Int. Cl.[4] B67D 5/54
U.S. Cl. 137—212 **7 Claims**



1. A coupler assembly for use with a valve sealing arrangement for sealing a container of fluid of the type having a valve assembly for providing access to the container and a valve assembly receiving member secured to the container, said valve assembly having first and second valves therein adapted to be operated by said coupler assembly to move said valves between an open and a closed position, said coupler assembly comprising:

(a) a coupler body having a side fitting extending therefrom connected to a first passage within said coupler body and further including a depending skirt portion receivable over said valve assembly receiving member and having at least one aperture extending therethrough;

(b) a probe member movable within said coupler body having a fitting connected to one end of said probe member, said probe member defining a passageway therethrough in communication with said fitting;

(c) said probe member being movable within said coupler body between an open and a closed position whereby in said open position said coupler body actuates said valves of said valve assembly to connect said passages in said coupler assembly to said open valves and in said closed position said passages are sealed from said valves of said valve assembly;

(d) actuating means for moving said probe between said first and second position, said actuating means comprising a lever assembly and a handle member connected to said lever assembly providing means for moving said lever assembly from an open position to a closed position, said lever assembly being pivotally secured to said coupler body for movement about a pivot axis, said lever assembly having engaging means for engaging said probe member, whereby pivoting of said lever assembly about said pivot axis moves said probe between said open position and said closed position, said lever assembly further comprising two lever arms spaced from each other and extending parallel from said pivot axis, said coupler body defining a pivot flange extending from one side thereof, each of said lever arms having one end pivotally secured to one side of said pivot flange by a pivot pin, the other end of said lever arms being connected to each other by a cross-member, said handle extending outwardly from said cross-member for grasping by an operator;

(e) retaining means for holding said probe in said open and said closed positions; and

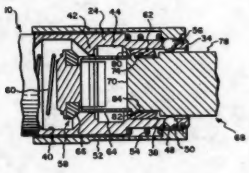
(f) securement means for releasably securing said coupler assembly to said valve assembly receiving member including at least one locking member movable within said aperture formed in said skirt portion from a first position spaced apart from said valve assembly receiving member to a second position in pressural engagement with said valve assembly, and operating means for selectively moving said locking member from said first position to said second position, said operating means comprising a ring shaped member rotatably carried by said coupler body, said ring shaped member having a cam surface adapted to engage said locking member to move said locking member from said first to said second position upon rotation of said ring shaped member relative to said coupler body from a first position to a second position, said ring shaped member including an inwardly extending locking tab having an aperture therethrough, said coupler body including a top surface and a bottom surface, a radially inwardly extending slot formed intermediate said top and bottom surfaces for closely receiving said locking tab of said ring member, and a pin receiving bore extending from said top surface to said slot.

4,612,953

FLUID COUPLING, SEAL REMOVAL TOOL AND METHOD

James E. Caroll, and Steven R. Zillig, 8828 Main St., both of Williamsville, N.Y. 14221, assignors to Steven R. Zillig, Williamsville, N.Y.

Filed Apr. 19, 1985, Ser. No. 725,251
Int. Cl.[4] F16L 37/28
U.S. Cl. 137—327 **6 Claims**



1. A seal removal tool capable of pulling an annular cylindrical coupling seal from a female quick connect fluid coupling assembly provided with a generally tubular main body having a bore extending from one end of the tubular body to an apertured seat forming portion, the bore being provided with a large diameter seal receiving portion adjacent said apertured seat forming portion, the coupling further including an annular cylindrical coupling seal disposed within said large diameter seal receiving portion, and said coupling further including a check valve having a skirt which passes through said apertured seat forming portion and which may extend into said coupling seal; said tool comprising:

an elongated rod like member having spaced apart first and second ends, a coupling seal supporting generally cylindrical first portion adjacent the first end, a manually engageable second portion adjacent the second end, and an intermediate generally cylindrical third portion disposed between the first and second portions, the coupling seal supporting first portion being adapted to support a coupling seal on its circumference and having a length at least equal to the length of the coupling seal and a diameter less than the internal diameter of the coupling seal to be pulled, the intermediate third portion being adapted to be inserted within the open end of said coupling and having an external diameter not greater than the internal diameter of the coupling, and the length of the first and third portions being at least as great as the length of the bore between the seat forming portion and the open end of the bore, and a radially outwardly extending portion formed

adjacent the first end of said rod like member and adapted to be slidably inserted into the seal when the tool is moved in one direction and to engage the seal and cause corresponding movement of the seal when the tool is moved in an opposite direction, said radially outwardly extending portion having a tapered leading surface and a normal trailing surface, the leading and trailing surfaces joining each other at a knife edge, the diameter of the radially outwardly extending portion being greater than the internal diameter of the coupling seal; and wherein the elongated member is further provided with a pilot portion between the first end and the seal supporting first portion, said pilot portion being adapted to engage the skirt of the check valve to center said one end of the rod like member within the coupling.

4,612,954

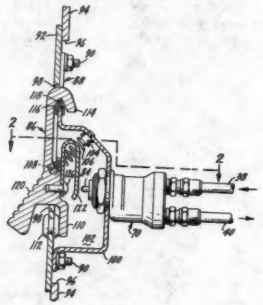
PEDAL OPERATED FLUSH VALVE

Frederic Lissau, deceased, late of Chicago, Ill. (by Edith Lissau, executrix), and Michael R. Stoltenberg, Des Plaines, Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Mar. 21, 1985, Ser. No. 714,216

Int. Cl.[4] F16L *5/00*; F16K *31/62*

U.S. Cl. 137—360 **11 Claims**



1. In a pedal-operated flushing system, a hydraulically-actuated flush valve connected by a hydraulic fluid supply line to a hydraulic fluid source, a control valve in the supply line between the source and flush valve, and a pedal for actuating the control valve, an improved mounting means for the pedal comprising, a faceplate suitable for attachment to a wall and covering an opening therein, the faceplate itself having an opening therein defining an upper and lower edge, a bracket attached to the faceplate on the side adjacent the wall opening, the bracket having a pocket forming an enclosure about the faceplate opening, the control valve being mounted on the pocket and extending into the enclosure, and the pedal being hinged to the bracket adjacent the upper edge of the faceplate opening, the pedal having a planar portion normally disposed parallel to the plane of the faceplate such that the planar portion normally substantially covers the faceplate opening and the hinged connection of the pedal and bracket, the pedal being pivotable into the enclosure to actuate the control valve.

4,612,955

EDGE WEAR TAB FOR A HIGH TEMPERATURE VALVE COMPONENT

Howard A. Purvis, P.O. Box 79286, Houston, Tex. 77279

Filed Nov. 29, 1984, Ser. No. 676,498

Int. Cl.[4] F16K *3/30, 51/00*

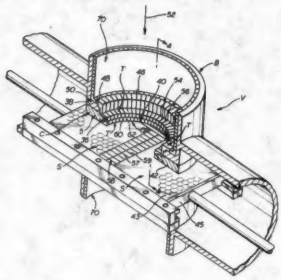
U.S. Cl. 137—375 **8 Claims**

1. An edge wear tab for a high temperature valve component, the valve component having an upstream face and a downstream face relative to a fluid flow within the valve, comprising:

a tab body having a leading wear surface for contacting the fluid flow;

said tab body having a trailing wear surface substantially perpendicular to said leading wear surface and for contacting the fluid flow;

said tab body having a stepped mounting surface extending from said leading wear surface to said trailing wear surface and mounted with the valve component, said stepped mounting surface further including:



a first mounting surface adjacent and substantially perpendicular to said leading wear surface;

a second mounting surface adjacent and substantially perpendicular to said trailing wear surface; and,

at least two step segments, each of said step segments including a pair of step surfaces substantially perpendicular to each other and said step segments disposed between said first and second mounting surfaces.

4,612,956

SAFETY HOLE FORMING A GASEOUS PRODUCT PREVENTIVE SIPHON

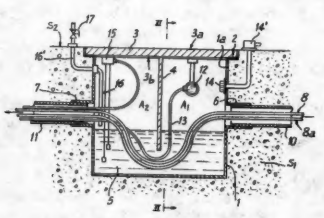
Claude Coquerel, Grentheville, France, assignor to Equipement Industriel Normand, Grentheville, France

Filed Jan. 14, 1985, Ser. No. 691,063

Claims priority, application European Pat. Off., Jan. 25, 1984, 84400167.7

Int. Cl.[4] F16K *31/02, 37/00*

U.S. Cl. 137—386 **3 Claims**



1. A safety hole forming a gaseous product preventive siphon comprising a vat having a bottom and a top, a cover closing the top of said vat, a vertical partition wall provided centrally to said cover, said vertical partition wall having a bottom portion placed at a determined height from the bottom of the vat, an electrically neutral liquid in the vat at a level higher than level of the bottom portion of said vertical partition wall, thereby forming within the vat a first and a second compartments completely isolated respectively together, connecting electric cables for connecting together measuring and delivering stations to at least one central unit being provided to pass from the first to the second compartments between said bottom portion of the vertical partition wall and said bottom of

the vat, safety means being further placed in at least one of the first and second compartments for detecting and preventing any explosive mixture or gaseous product fro reaching the delivery station, for controlling maintaining and the level of the neutral liquid above the partition wall to maintain the explosive mixture or gaseous product within the first compartment and for venting the explosive mixture or gaseous mixture or gaseous product to the atmosphere.

4,612,957

VACUUM PUMP AND TRAP COMBINATION

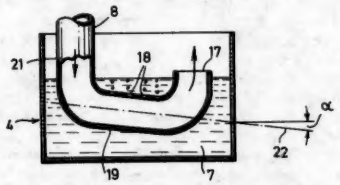
Lutz Arndt, Troisdorf; Paul Bachmann; Hanns-Peter Berges, both of Cologne; Wolfgang Leier, Bergisch Gladbach, and Dieter Vorberg, Erftstadt-Lechenich, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 695,909

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404556; Jul. 9, 1984, 3425177; Sep. 29, 1984, 3435921

Int. Cl.[4] E03B *5/00*

U.S. Cl. 137—565 **3 Claims**



1. A vacuum pump and trap combination comprising:
a vacuum pump with suction inlet and discharge outlet; and
a trap configured in the manner of a siphon and preventing the entry of water vapor or oxygen and disposed following said discharge outlet in communication therewith, said trap including a casing partially filled with a trap liquid and a dip tube disposed therein, said dip tube being bent adjacent an end thereof immersed in trap liquid and having a terminal opening lying above the trap liquid level, and having a wall section lying below the trap liquid level and having perforations therein.

4,612,958

BOILER SAFETY VALVE INSTALLATIONS

John W. E. Campbell, Maidenhead, England, assignor to Babcock Power Limited, London, England

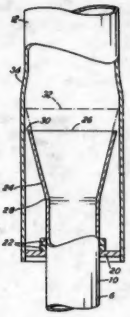
Filed Feb. 17, 1984, Ser. No. 581,064

Claims priority, application United Kingdom, Feb. 22, 1983, 8304886

Int. Cl.[4] F16K *47/00*

U.S. Cl. 137—801 **1 Claim**

1. A boiler safety valve installation including a boiler steam pipe having a safety valve with an outlet pipe positioned thereon and a vent pipe for receiving relief steam discharges from the safety valve, said outlet pipe having a discharge mouth positioned co-axially with said vent pipe to direct an expanding jet of relief steam along said vent pipe, wherein the said discharge mouth is provided with an expanding nozzle diverging outwardly from the outlet pipe as a frusto-conical nozzle having an included angle of between approximately 12° (0.2 steradian) and 60° (1 steradian), and adapted to accelerate the expanding relief steam jet, a transition from the safety valve outlet pipe to the expanding nozzle being formed as a smoothly curved surface, the expanding nozzle having a lip positioned to be closely spaced from the vent pipe, and the vent pipe being formed with a smooth constriction reducing the internal diameter of the vent pipe by between approximately 5% and 10%, displaced downstream of the discharge mouth and adapted to



produce a reduction in relief steam flow velocity from supersonic to subsonic velocity.

4,612,959

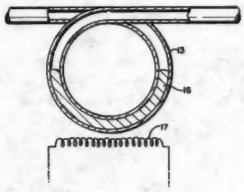
VALVELESS SHUT-OFF AND TRANSFER DEVICE

Walter H. Costello, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1985, Ser. No. 731,434

Int. Cl.[4] F15C *1/04*

U.S. Cl. 137—828 **7 Claims**



1. A shut-off and transfer device comprising:
a conduit having an inlet and an outlet;
a loop in said conduit;
a eutectic material in said loop, said material solidifying below its critical temperature to block said loop, and liquefying above said critical temperature to open said conduit to the passage of fluid therethrough;
a baffled enclosure being connected to the outlet of said conduit, having baffles therein which retain said eutectic material when it is liquefied and fluid is passing through said device, said eutectic material flowing back into said loop when the pressure at said inlet and said outlet are equalized; and
means for controlling the temperature of said material above and below said critical temperature.

4,612,960

VALVE ASSEMBLY

Floyd V. Edwards, Cedarville, and Dennis A. Boehmer, Xenia, both of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Continuation-in-part of Ser. No. 703,850, Feb. 21, 1985, Pat. No. 4,566,493. This application Jun. 14, 1985, Ser. No. 744,710

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—846 **16 Claims**

1. Valve assembly for use within a flow path for permitting relatively free flow in said flow path in a first direction and for

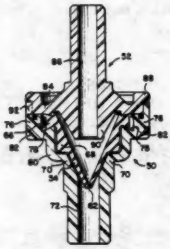
preventing flow in said path in a second, opposite direction, comprising:

a flow regulator constructed as a single piece from a resilient material, said regulator including a pair of lips, each of said lips having a lip base and an outer end;

said lips being arranged in a converging relationship to define for said regulator an open end adjacent said lip bases, and a normally closed end at said lip outer ends whereat said lips are disposed adjacent each other to define a normally closed slit therebetween, said regulator further including at least one side wall interconnecting said lips and an annular flange having an axial height extending outwardly at said open end;

a housing outlet portion defining a housing interior having a closed outlet end and an open sealing end, said housing outlet portion further including an outlet port communicating with said outlet end and an annular collar disposed outwardly about said sealing end; and

a housing inlet portion having a cover plate and an inlet port communicating therethrough;



said regulator being disposed within said housing outlet portion with said annular flange contained within said annular collar and said lip outer ends extending toward said outlet end of said housing interior;

said cover plate being attached to said annular collar for securing said regulator by contact with said flange and for sealing said housing interior;

said housing outlet portion defining a first sealing ring along said housing interior extending inwardly from said collar adjacent said flange, and said cover plate defining a second sealing ring adjacent said flange, said first and second sealing rings being disposed on opposite sides of and in contact with said flange; and

at least one of said first and second sealing rings having a bevel, said bevel being defined and said height of said flange being selected so that said flange is compressed between said first and second sealing rings to a greater degree along the portion of said flange adjacent said lip bases than along the portion of said flnage adjacent said collar.

4,612,961

TUBE SEALING DEVICE

Manfred Vetter, Burg Langendorf, 5352 Zülpich, Fed. Rep. of Germany

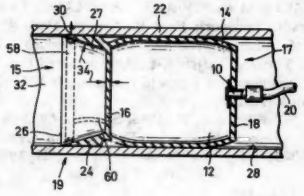
Filed May 6, 1985, Ser. No. 730,786

Claims priority, application Fed. Rep. of Germany, May 5, 1984, 8413877

Int. Cl.[4] F16L *55/12*

U.S. Cl. 138—93 **10 Claims**

1. Sealing device for a tube which can be installed at a selected location on the inner wall of the tube and can withstand a pressure differential between a higher pressure and a lower pressure in the tube, wherein said device has a first end area facing the higher pressure in the tube, and a second end area on the lower pressure side in the tube, and is constructed of a cylindrical jacket made of flexible material impermeable to fluids and gas, and a circular end partition made of material impermeable to gas and fluids which seals the jacket tightly at the second end area characterized by the fact that on the first end area on the side facing the higher pressure there is a circular, ring-shaped sealing lip in form of an axial extension of the jacket, said lip protruding from the jacket towards the higher pressure side in the tube, having an inner side subjected to the higher pressure, being made of flexible material impermeable to fluids and gas, having a free end and an adjustable spreading device which can be reset and can press the sealing lip and its



free end against the inner wall of the tube, so that when the spreading device is not activated, the lip is in a radially retracted position and it lies within a cylinder whose radius is smaller than the inner radius of the tube, but when the spreading device is activated, the lip, especially at its free end, is pressed outward and lies around the circle on all surfaces pressed against the inner wall of the tube to be sealed, whereby the higher pressure acting on the inner side increases the pressure of the lip onto the inner wall of the tube and causes there an outward pressure which becomes larger as the pressure of the higher pressure side increases.

4,612,962

SPRING-LOADED VALVE

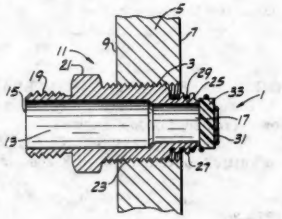
Michael J. Purvis, Fenton, Mo., assignor to Control Devices, Incorporated, St. Louis, Mo.

Continuation of Ser. No. 246,600, Mar. 23, 1981, abandoned.

This application Jun. 14, 1985, Ser. No. 744,550

Int. Cl.[4] F16K *15/02*

U.S. Cl. 137—543.17 **8 Claims**



1. A valve comprising a valve body having a passage extending therethrough to one end of the body constituting an outlet end of the body, said body having a cylindric extension at said outlet end, said passage extending through said extension, the outer end of said extension constituting a valve seat, said extension having a circumferential groove, a coil spring secured at one end thereof constituting its inner end to said extension by engagement thereof in said circumferential groove, said spring extending endwise from said extension and having at its outer end an inwardly extending end portion, a valve member confined within the spring between the valve seat and said inwardly extending end portion of the spring, the spring being in tension and acting via engagement of its inwardly extending end portion with said valve member to hold the valve member

in engagement with the valve seat, the valve member being movable away from the seat against the bias of the spring, the spring being of cylindrical form of generally uniform diameter except for said inwardly extending end portion with said springs internal diameter corresponding to the diameter of said extension in said circumferential groove, the valve member being of circular outline with its external diameter such that it fits wholly within the internal diameter of the spring without any part thereof between convolutions of the spring, whereby the valve member is held confined in the spring solely by said inwardly extending end portion of the spring.

4,612,963

MACHINE FOR MAKING WIRE COMB BINDERS

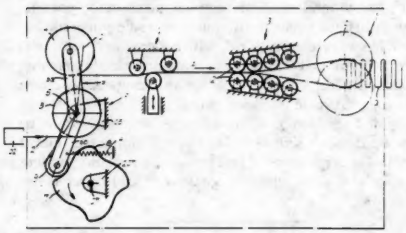
Fritz Witte, Wendlingen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,666

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305946

Int. Cl.[4] B21F *1/00*

U.S. Cl. 140—105 **8 Claims**



1. In a machine for converting a continuous length of wire into a continuous comb-like product wherein the wire advances along an elongated path from a source of supply to a deforming unit which includes means for intermittently drawing predetermined unit lengths of wire at a predetermined frequency in a direction from such source, apparatus for converting intermittent advances of the wire under the action of the deforming unit into an uninterrupted movement of the wire from the source, comprising a lever having follower means; a fixed fulcrum for said lever; means for pivoting said lever with reference to said fulcrum at said predetermined frequency, including a rotary cam which is tracked by said follower means; a first rotary member having an axis coinciding with the pivot axis of said lever; and a second rotary member rotatably mounted on and pivotable with said lever, the wire which advances along said path being trained first around said first rotary member and thereupon around said second rotary member, as considered in said direction.

4,612,964

COMBINED AUGER AND AIR-TYPE VALVE BAG FILLING MACHINE

Will G. Durant, Tustin, Calif., assignor to Westmont, Inc., Santa Fe Springs, Calif.

Filed Apr. 1, 1985, Ser. No. 718,660

Int. Cl.[4] B65B *1/18*

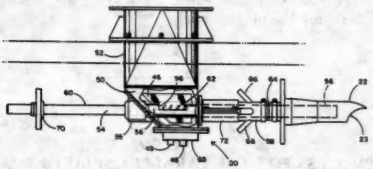
U.S. Cl. 141—68 **14 Claims**

11. An apparatus for dispensing particulate material and comprising:

a spout from which said particulate material may be dispensed;

an elongated coaxial dual tube connected at one end to said spout and having a central passage and an annular passage;

auger means for transferring said particulate material from a supply source to said spout through said central passage; and



air pressure means for transferring said particulate material from a supply source to said spout through said annular passage.

4,612,965

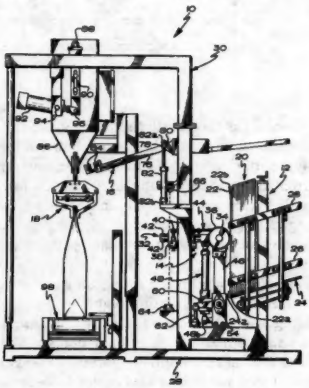
AUTOMATIC BAG HANGING DEVICE

Harold R. McGregor, 1444 Lincoln Ave. SE., Qwatanna, Minn. 55060

Filed Aug. 30, 1984, Ser. No. 646,639

Int. Cl.[4] B65B *1/04, 1/18, 43/26*

U.S. Cl. 141—114 **20 Claims**



1. An automatic bag pickup and hanging device, said device comprising:

bag supply means for positioning a stack of bags in a predetermined orientation;

pickup means comprising a fold-down arm reciprocally rotatable about an axis of rotation between a pickup position adjacent said bag supply means and a transfer position;

a means on said fold-down arm for gripping a bag from said supply means;

a filling spout; and delivery means including means for engaging and holding a bag, said delivery means being movable between said transfer position and said spout for transfering said bag from said fold-down arm at said transfer position and hanging said bag on said spout, said delivery means being positioned spatially apart from said pickup means;

whereby the gripping means on the fold-down arm rotates in one direction to the pickup position and grips the bag from the bag supply means, the fold-down arm then rotating in the opposite direction to the transfer position with the bag gripped thereon, and the delivery means thence transfering the bag from the fold-down arm and hanging the bag on the spout;

and whereby the fold-down arm and the delivery means

operate in timed unison, so that the top edge of a bag may be folded over and positioned at the transfer position by the fold-down arm while the delivery arm is engaged in hanging the previous bag.

4,612,966

PROCESS FOR THE PARALLEL SPLITTING UP OF TRIMMED WORKPIECE PANELS, IN PARTICULAR, OF LAMINATED, COMPRESSED WOOD PANELS

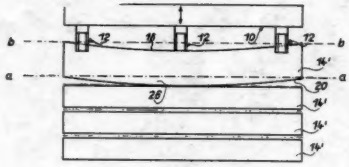
Detlef Jenkner, Schwarzwaldstr. 68, Herrenberg, Fed. Rep. of Germany D-7033

Filed Apr. 3, 1985, Ser. No. 719,489

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 3425204

Int. Cl.⁴ B27L *7/00*

U.S. Cl. 144—366 **1 Claim**



1. A process for the parallel splitting up of trimmed workpiece panels and, in particular, laminated, compressed wood panels by a cutter defining a cutting plane, into cut sections of predetermined sectional widths, all of which having substantially parallel trimmed edges, which comprises the steps of:

aligning a single workpiece panel, with a trimmed edge facing away from a cutting plane, parallel to said cutting plane;

clamping of said workpiece panel along a plane of alignment with respect to said cutting plane;

displacing said panel along a path corresponding to said desired sectional width of said cut section and in the direction of and substantially parallel to said cutting plane;

feeding of said panel into said cutter in order to sever and divide off one or more single cut panel sections, having substantially parallel trimmed edges;

releasing of said clamping of the remainder of said workpiece panel so as to permit said trimmed marginal edge portions thereof to warp;

reclamping of said warped workpiece panel;

displacing said warped workpiece panel along a path corresponding to said desired sectional width of said cut section and in the direction of and substantially parallel to said cutting plane;

feeding of said workpiece panel into said cutter, so as to sever and remove a first selected warped marginal edge portion thereof;

realigning of the remaining portion of said workpiece panel with respect to said cutting plane, so as to correspond to said desired sectional width of said cut section and align said remaining warped marginal edge portion with said cutting plane;

displacing said remaining workpiece panel in the direction of and substantially parallel to said cutting plane; and

feeding of said panel into said cutting so as to sever and remove said remaining warped marginal edge portion of said panel and result in a cut section having said predetermined sectional width and substantially parallel trimmed edges.

4,612,967

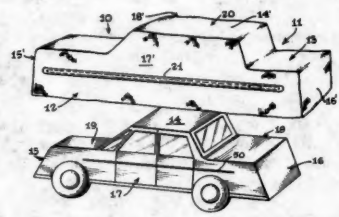
PADDED CAR COVER

Christopher R. Kamen, and James E. Bollinger, both of 351 Upper Lake Rd., Thousand Oaks, Calif. 91361

Filed Feb. 14, 1985, Ser. No. 701,548

Int. Cl.⁴ B60J *11/00*

U.S. Cl. 150—52 K **6 Claims**



1. An improved car cover apparatus for use in combination with a car wherein said car cover apparatus comprises:

a car cover member forming an inverted fabric envelope over a car, wherein said fabric envelope has a top portion, a front portion, a rear portion and two side portions;

elongated pocket elements extending along said side portions of said cover member wherein each elongated pocket element is provided with an elongated aperture disposed proximate one end; and

an elongated resilient padding element dimensioned to be received through said aperture in each elongated pocket element for disposition of said elongated resilient padding elements along the two side portions of said cover member.

4,612,968

METHOD OF CASTING USING EXPENDABLE PATTERNS

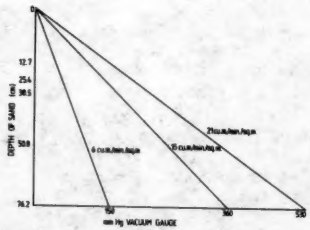
Michael C. Ashton, Sheffield; Derek A. Bish, Dronfield, and Stephen G. Sharman, Greenhill, all of England, assignors to Steel Castings Research and Trade Association, Sheffield, England

Continuation of Ser. No. 686,622, Dec. 28, 1984, abandoned, which is a continuation of Ser. No. 322,508, Nov. 18, 1981, abandoned. This application Aug. 7, 1985, Ser. No. 763,759

Claims priority, application United Kingdom, Nov. 21, 1980, 8037503

Int. Cl.⁴ B22C *9/04, 15/10, 15/22*

U.S. Cl. 164—34 **5 Claims**



1. A method of casting an article of molten metal in a mould box, said box having a top open to the atmosphere, comprising

(i) placing loose unbonded particulate material in said box.

(ii) locating within said particulate material an expendable pattern, said pattern being formed of an expanded polystyrene having a density of about 20 kg/cu.m., said pattern having a gas permeable refractory coating thereon,

(iii) subjecting said particulate material to vibration at a frequency of at least 40 to 50 Hertz, so that the mould box is subjected to an acceleration of about 1 to 1.5 g, thereby causing said particulate material to be compacted to the maximum bulk density and to be in intimate contact with said refractory coating on said pattern, said vibration being the only means of compacting said particulate material,

(iv) applying a vacuum to said compacted particulate material so as to create a pressure gradient in the height of said compacted material, and

(v) supplying molten metal into said box so as to vaporize said pattern and form said article of molten metal whereby said molten metal gasifies said expendable pattern, said gases being drawn through said gas permeable coating by said vacuum whereby the pressure of said gases is prevented from disturbing the integrity of said coating and said compacted particulate material remains in intimate contact therewith.

4,612,969

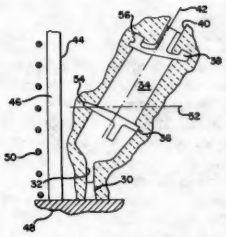
METHOD OF AND APPARATUS FOR CASTING ARTICLES WITH PREDETERMINED CRYSTALLINE ORIENTATION

Lamar Burd, Andover; Evan R. Miller, Flanders; Eugene J. Carozza, Succasunna, all of N.J., and Robert E. Grunstra, North Muskegon, Mich., assignors to Howmet Turbine Components Corporation, Greenwich, Conn.

Filed Apr. 27, 1983, Ser. No. 489,065

Int. Cl.[4] B22D *25/06, 27/04*

U.S. Cl. 164—122.2 **2 Claims**



1. In a method for the production of an article defining a central axis having a substantially unidirectional grain orientation, said method including providing a mold containing at least one mold cavity, said mold cavity having an axis coinciding with the central axis of said article and said mold cavity defining cross-sectional planar portions which are transverse to said mold cavity axis, introducing a molten charge to the mold, and providing means for maintaining a temperature gradient whereby solidification of the charge commences at the lower end of the mold cavity and progresses upwardly along a solidification front, the improvement comprising locating said mold cavity with said axis thereof tilted at an angle of from about 5 to about 75 degrees relative to the vertical, and maintaining said solidification front of the charge substantially horizontal throughout the solidification whereby said cross-sectional planar portions of said mold cavity are positioned at an angle relative to the plane of said solidification front which substantially corresponds with the angle of the mold cavity axis to the vertical, wherein said mold cavity includes at least one cavity extension in a portion of the mold cavity located above a line coinciding with said axis of the mold cavity whereby the charge fed into said extension does not solidify until after all other portions in the same transverse cross-sectional plane of the article have solidified, and including the step of removing the portion of the casting which solidified in the cavity extension after separating the casting from the mold.

2. In an apparatus for producing an article defining a central axis and having a substantially unidirectional grain orientation, said apparatus including a mold for holding a molten charge, said mold containing one or more cavities, said mold cavity having an axis coinciding with the central axis of said article, and said mold cavity defining cross-sectional planar portions which are transverse to said mold cavity axis, and means for maintaining a temperature gradient along the length of the mold whereby solidification of the charge commences at the lower end of each mold cavity and progresses upwardly along a solidification front, the improvement wherein said axis of the mold cavity is tilted at an angle from about 5 to 75 degrees relative to the vertical, the solidification front of the charge remaining substantially horizontal throughout the solidification whereby said cross-sectional planar portions of said mold cavity are positioned at an angle relative to the plane of said solidification front which substantially corresponds with the angle of the mold cavity axis to the vertical, wherein said mold cavity has at least one cavity extension in a portion of the mold located above a line coinciding with said axis of the mold cavity whereby the charge fed into said extension does not solidify until after all other portions in the same transverse cross-sectional plane of the article have solidified, the portion of the casting which solidified in the cavity extension being removed after separation of the casting from the mold.

4,612,970

GUIDING DEVICE FOR AN OSCILLATING CONTINUOUS CASTING MOLD

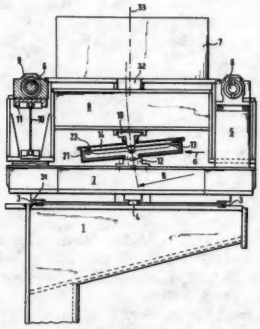
Horst Grothe, Kaarst, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,278

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403598

Int. Cl.[4] B22D *11/12*

U.S. Cl. 164—416 **14 Claims**



1. In a continuous casting apparatus including an oscillating mold, a mold lifting platform and a frame,

a guiding device, said guiding device comprising:

a spring holder having two end portions;

first fastening means for connecting said spring holder to the frame;

a spring having two extremities each of which being clamped to the aligned one of said end portions so that said spring bridges said spring holder; and

second fastening means for connecting said spring to the mold lifting platform.

4,612,971

METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF STRIP USING OSCILLATING MOLD ASSEMBLY

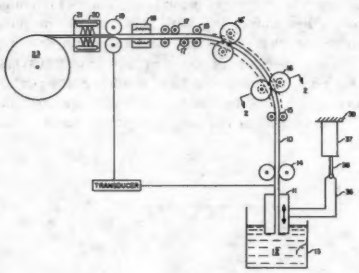
Terry F. Bower, Needham; M. Ronald Randlett, and George Shinopulos, both of Burlington, all of Mass., assignors to Kennecott Corporation, Stamford, Conn.

Continuation of Ser. No. 184,168, Sep. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 956,793, Nov. 1, 1978, Pat. No. 4,232,727, which is a continuation-in-part of Ser. No. 928,881, Jun. 28, 1978, Pat. No. 4,211,270. This application Mar. 5, 1985, Ser. No. 708,115

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.[4] B22D *11/12*; B21B *1/44, 13/22*

U.S. Cl. 164—454 9 Claims



1. A method for the continuous production of metallic strip from a melt comprising:

(1) continuously casting a metallic rod from said melt using a mold which oscillates in a direction parallel to the direction of travel of said rod and in a pattern of forward and reverse strokes with respect to a fixed reference position,

(2) continuously regulating the speed of the metallic rod to maintain a substantially constant forward speed before the rod is converted to strip, said regulating step is accomplished by:

(a) changing the direction of travel of said rod after emergence from said chilled mold,

(b) permitting slack through lateral deflections of said rod, and

(c) advancing said rod in a manner to control said slack.

(3) continuously hot rolling said continuously cast rod into finished strip, said casting step, regulating step and hot rolling step being performed to act on a metallic rod which is continuous from said casting step through said hot rolling step to continuously form an integrated strip.

4,612,972

METHOD AND APPARATUS FOR ELECTRO-MAGNETIC CASTING OF COMPLEX SHAPES

Jonathan A. Dantzig, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 336,656, Jan. 4, 1982. This application May 24, 1984, Ser. No. 613,840

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—465 12 Claims

1. An apparatus for electromagnetically casting molten metal material into a longitudinally extending casting, comprising:

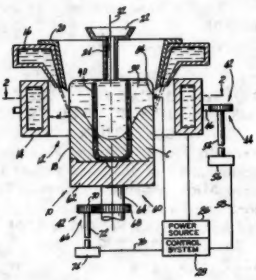
inductor means generating an electromagnetic containment force field adapted to apply said electromagnetic containment force field to the peripheral surface of said molten metal material, said force field defining a casting zone having a longitudinal axis in the direction of casting extending therethrough and a desired transverse cross section extending perpendicular to said longitudinal axis being adapted to receive said molten metal material and to form said casting with a corresponding desired transverae cross section;

means for rotating said inductor means about said longitudinal axis to rotate the transverse cross section of said force field so as to rotate the desired transverse cross section of the molten metal material in the casting zone about said longitudinal axis; and

means for supporting the downstream end of said casting and withdrawing said casting from said casting zone.

6. A process for electromagnetically casting molten metal material into a longitudinally extending casting, comprising steps of:

providing an inductor for generating an electromagnetic containment force field adapted to be applied to the peripheral surface of the molten metal material, said force field defining a casting zone having a longitudinal axis in the direction of casting extending therethrough and a desired transverse cross section extending perpendicular to said longitudinal axis;



receiving said molten metal material within said casting zone and forming said molten material into a desired transverse cross section, corresponding to the desired transverse cross section of said force field;

rotating said inductor about said longitudinal axis to rotate the transverse cross section of said force field about said longitudinal axis whereby the desired transverse cross section of the molten metal material in the casting zone is rotated about said longitudinal axis; and

withdrawing the casting from said casting zone.

4,612,973

COLD-HEARTH MELT-SPINNING APPARATUS FOR PROVIDING CONTINUOUS CASTING OF REFRACTORY AND REACTIVE ALLOYS

Sung-Hyun Whang, Brookline, Mass., assignor to Northeastern University, Boston, Mass.

Filed Aug. 31, 1984, Ser. No. 646,351

Int. Cl.[4] B22D *11/06, 11/10, 27/15*

U.S. Cl. 164—508 22 Claims

1. A cold-hearth melt-spinning apparatus for providing continuous casting of refractory and reactive alloys, comprising:

a crucible having first walls defining a charge receiving cavity , said first walls having a surface area confronting said cavity;

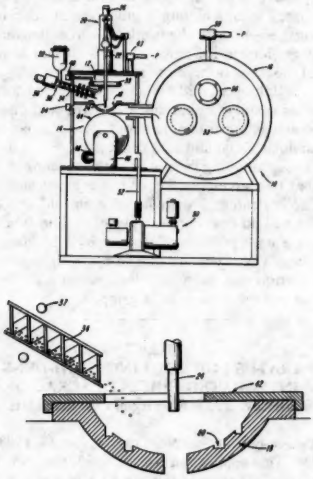
first means coupled to said crucible for cooling said crucible;

second means coupled to said cooled crucible for impeding thermal flow between said cavity and said first walls , said second means including a predetermined pattern of spaced grooves having preselected dimensions integrally formed on said surface area of said first walls in such a way that the dimensions of the grooves pattern are selected to be no larger than those dimensions beyond which the surface

tension of a melt is insufficient to prevent the melt from wetting the walls of the grooves;

third means coupled to said cooled crucible and in fluid communication with said charge receiving cavity having second walls for providing a molten jet emitting nozzle in such a way that thermal flow is impeded between said second walls and said first walls of said cooled crucible;

fourth means for superheating a charge received in said cavity to form a melt;



fifth means for controllably emitting said melt through said molten jet emitting nozzle in a molten jet stream;

sixth means for charging said charge-receiving cavity;

seventh means for rapidly quenching said molten jet stream to controllably produce quenched material in a desired physical form; and

eighth means for receiving said quenched material.

4,612,974

HEAT STORAGE DEVICE

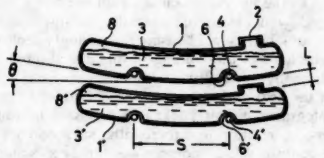
Michio Yanadori, Ryuugasaki; Tomohiro Kawano, Minori; Seigo Miyamoto, Takahagi; Yasuaki Nara, Tsuchiura, and Masahiro Oguri, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1985, Ser. No. 704,413

Claims priority, application Japan, Feb. 22, 1984, 59-30239

Int. Cl.[4] F28D *17/00*

U.S. Cl. 165—10 **3 Claims**



1. A heat storage device comprising a plurality of heat storage vessels, each vessel storing a heat storage material therein, said vessels being arranged on supports in a rack form, and gaps for the flow of an external fluid being defined between said heat storage vessels adjacent to one another in the vertical direction, the lower surface of each of said heat storage vessels having grooves for said supports defined therein so that said supports do not project from the bottom surfaces of said heat storage vessels.

4,612,975

AIR CONDITIONING DEVICE INSTALLED IN A CABIN OF AN EARTH-MOVING VEHICLE

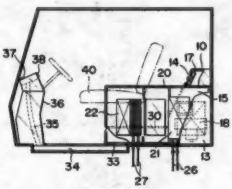
Masanori Ikari, Iruma, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,843

Claims priority, application Japan, Feb. 7, 1984, 59-15045; Feb. 7, 1984, 59-15046

Int. Cl.[4] B60H *1/00*

U.S. Cl. 165—43 **1 Claim**



1. In an air conditioning device installed in a cabin of an earth-moving vehicle, said cabin having an operator's seat and a dashboard, said air conditioning device comprising air cooling means, air heating means, and a blower having intake and outlet sides for blowing internal air and external air to intake sides of said cooling means or said heating means, the improvement wherein internal air intake means communicating with said intake side of said blower are formed on both the right and left sides in the cabin at the back of said operator's seat; blower means are formed in said dashboard positioned in front in said cabin to blow cold air or hot air supplied from said cooling means or said heating means; a first housing for intaking internal air and external air is located at the back of said operator's seat, said housing enclosing said internal air intake means, said external air intake means, filter means for internal air and external air, and said blower; a second housing is located by one side of said operator's seat containing said air cooling means and said air heating means; and a third housing for mixing air is located under said operator's seat containing blower means for blowing said cold air or said hot air; wherein said outlet side of said blower is opened into said second housing so as to communicate with said air cooling means and said air heating means, and outlet sides of said cooling means and said heating means are opened into said third housing so as to communicate therewith.

4,612,976

STEAM GENERATOR FOR A NUCLEAR REACTOR COOLED WITH LIQUID METAL

Michel Soucille, Massy; Laurent Castelnau, Paris, and René M. Traiteur, Ris Orangis, all of France, assignors to Novatome, le Plessis Robinson, France

Filed Feb. 9, 1984, Ser. No. 578,405

Claims priority, application France, Feb. 10, 1983, 83 02108

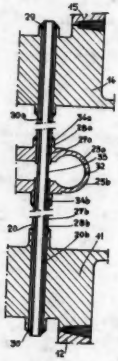
Int. Cl.[4] F28F *11/00*

U.S. Cl. 165—70 **6 Claims**

1. In a nuclear reactor cooled with a first liquid metal, a steam generator comprising a substantially cylindrical enclosure (1), arranged with its axis vertical, enclosing a bundle of double-walled tubes (10) each consisting of two coaxial tubes (27, 28) having an inner tube (28) communicating at one of its ends with a water distribution device (12) or collector and at its other end with a steam collector (15), and an outer tube (27) contacting with its outer wall the liquid metal circulating downwards in said enclosure (1), wherein said bundle (10)

consists of substantially straight tubes (**20**) directed in the axial direction of said enclosure (**1**), each formed by at least two successive sections (**20***a* and **20***b*) in the axial direction, each of said tubes comprising

(a) an outer tube (**27***a;* **27***b*) welded at one of its ends at least to the wall of a leakage collecting chamber (**25**) arranged wholly inside said enclosure (**1**) in a region remote from its ends, passing through said wall and being separated from



the outer tube of the adjacent section (**27***a* or **27***b*) welded to said collecting chamber (**25**); and

(b) an inner tube (**28***a* or **28***b*) welded to the inner tube of the adjacent section (**28***a* or **28***b*), the connecting weld (**35**) being placed inside said collecting chamber (**25**), a narrow leakage space between the facing walls of said inner and outer tubes (**27** and **28**) of any section of a said tube (**20***a* or **20***b*) communicating solely with the inner space of at least one collecting chamber (**25**).

4,612,977

DRAIN DEVICE OF AUTOMOTIVE RADIATOR

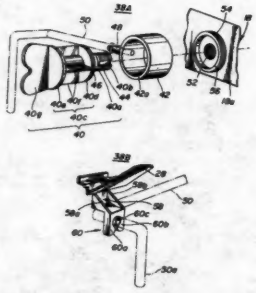
Toshihiko Hayashi, Zama, and Yoshitomi Matsuzaki, Hatano, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 15, 1985, Ser. No. 765,820

Claims priority, application Japan, Aug. 28, 1984, 59-177489

Int. Cl.[4] **F16K** *5/00*

U.S. Cl. 165—71 **6 Claims**



1. In a motor vehicle having a radiator and a fan shroud which extends from said radiator toward an engine of the vehicle

a drain device for the radiator, comprising:

an annular ridge formed on said radiator in a manner to surround a drain bore of the same;

a drain cock means screwed to said drain bore of the radiator to seal the same, said drain cock means including a portion for entering said drain bore having an axial groove;

a collar member sealingly and rotatably disposed about both said annular ridge and said drain cock means to define therebetween at least one chamber which becomes in conmunication with the interior of the radiator via said axial groove when said drain cock means is loosened, said drain cock means having a guide collar support portion for engagement with the inside of said collar member and a sealing element for engagement with said annular ridge to seal the drain bore of the radiator when said drain cock means is tightened, said collar member being formed with an outlet opening communicated with said chamber and said collar being rotatable about its axis relative to both said annular ridge and said drain cock;

a drain hose extending from said outlet opening of the collar member to a given portion of the vehicle; and

a hose holder integral with said fan shroud and holding a portion of said drain hose in place, said hose holder comprising a base portion reinforced by ribs integral therewith, and a clip portion extending from one end of said base portion and including two spaced arms by which a portion of said drain hose is gripped.

4,612,978

APPARATUS FOR COOLING HIGH-DENSITY INTEGRATED CIRCUIT PACKAGES

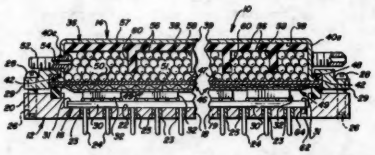
John M. Cutchaw, 7333 E. Virginia Ave., Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 513,618, Jul. 14, 1983, Pat. No. 4,531,146. This application Apr. 8, 1985, Ser. No. 721,074

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.[4] **H01L** *23/46*

U.S. Cl. 165—104.33 **28 Claims**



1. An apparatus for cooling a high-density integrated circuit package of the type having a substrate with a plurality of discrete integrated circuits arranged thereon in a predetermined array, said apparatus comprising:

(a) a housing defining an open coolant chamber which is sized so that its opening substantially matches the surface area of the substrate of the integrated circuit package, said housing for positioning in overlaying relationship with respect to the integrated circuit package;

(b) a rigid wall means of thermally conductive material fixedly attached to said housing for sealingly enclosing the coolant chamber thereof and having a heat input surface;

(c) a thermally conductive contact means interposed between the heat input surface of said rigid wall means and the integrated circuit package when said housing is in overlaying relationship therewith, said contact means being conformable to compensate for dimensional variations to provide positive thermal contact with the heat input surface of said rigid wall and with each of the discrete integrated circuits;

(d) said housing having an inlet port and an outlet port by which coolant is passable through the coolant chamber of said housing; and

(e) a plurality of spheroids in the coolant chamber of said

housing and substantially filling the coolant chamber, each of said spheroids being of metal for conducting heat away from said rigid wall for maximizing the heat exchange surface area into which the coolant comes in contact when passed through the coolant chamber of said housing.

4,612,979

APPARATUS FOR THE COOLING OF ELECTRONIC ASSEMBLIES OR COMPONENTS

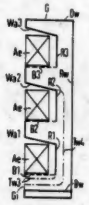
Claus-Peter Heitzig, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,353

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432105

Int. Cl.[4] H01L *23/46*

U.S. Cl. 165—129 **8 Claims**



1. Apparatus for the cooling of electronic assemblies or components arranged in slide-in circuits located one above the other in a rack, the apparatus of the type including means for providing a cooling air supply to the individual slide-in circuits from their respective underside, the air leaving the respective slide-in circuit as warm air after having been heated therein, the apparatus comprising:

an underside and at least one side of the rack and the back of the rack configured to form a channel arrangement, the channel arrangement is connected to receive the cooling air supply communicating with a port provided on the rack underside and which is also in communication with the open undersides of all slide-in circuits for the uptake of cooling air; and the channel arrangement comprising channels individually leading from the cooling air supply to the underside of the individual slide-in circuits.

4,612,980

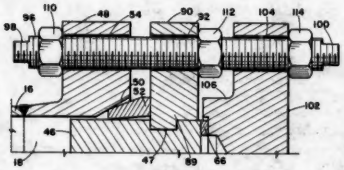
DUAL PURPOSE CLOSURE FOR HEAT EXCHANGERS

Wf Roberts, 4731 S. Columbia Pl., Tulsa, Okla. 74105

Division of Ser. No. 551,573, Nov. 14, 1983, Pat. No. 4,570,701. This application Oct. 25, 1985, Ser. No. 792,279

Int. Cl.[4] F28F *9/26*

U.S. Cl. 165—158 **4 Claims**



1. An end closure for a heat exchanger of the type having a shell side enclosure and at least one tube within said shell, the closure comprising a shell flange attached to the end of said shell, a tube sheet encompassing said tube sheet having a peripheral groove, a tubular connection and a tube flange for said tubular connection, said tube flange in facing alignment with said shell flange, a thrust flange divided into at least two sections and positionable between said shell flange and said tube sheet and including an inner peripheral lip for interconnection with said groove, a plurality of axially aligned openings in said shell, tube and thrust flanges to receive connection bolts or studs to assemble said closure, an enlarged means on said bolt or stud abuttable against said thrust flange, means to seal between said tube sheet and said shell flange, and means to seal between said tube flange and said tube sheet.

4,612,981

CERAMIC RECUPERATOR TUBE AND A RECUPERATOR EMPLOYING PLURAL SUCH TUBES

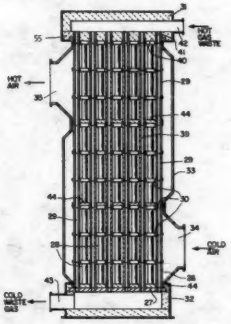
Helmut Palz, and Hartmut Kainer, both of Wiesbaden, Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,278

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333764

Int. Cl.[4] F28F *9/02*

U.S. Cl. 165—158 **22 Claims**



1. In a recuperator of the type including plural ceramic recuperator tubes arranged vertically on top of each other, each said tube having an outer periphery, first and second opposite ends and a gas passage extending longitudinally between said ends, the improvement wherein:

said first end includes an annular sealing surface extending radially inwardly from said periphery, and an annular projection defined by a conical surface extending axially from said sealing surface to an end surface of said first end;

said second end includes a square flange extending outwardly from said periphery and defined by four entirely planar flange side walls, and a stepped seal extending axially inwardly into said flange from an end surface of said second end, said stepped seal comprising axially outer and inner steps, said outer step comprising at least one axial surface extending inwardly from said end surface of said second end and a ground annular bearing surface extending radially inwardly from said axial surface, and said inner step comprising an annular conical sealing surface extending axially inwardly from said bearing surface and an annular sealing surface extending radially inwardly from said conical sealing surface to said gas passage;

said outer periphery is uniform from said flange at said second end to said annular sealing surface at said first end; and

said projection and said sealing surface of said first end of one said tube extend into and seal with said stepped seal of said second end of another said tube with said end surface of said first end facing said annular sealing surface of said

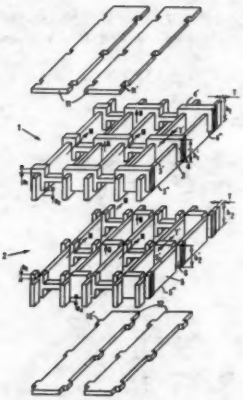
second end, with said conical surface of said first end facing said conical sealing surface of said second end, with said annular sealing surface of said first end facing said bearing surface of said second end, and with said periphery of said first tube facing said axial surface of said second end.

4,612,982

HEAT EXCHANGER OF MODULAR STRUCTURE

Alain Grehier, Paris; Alexandre Rojey, Garches, and Francois Benoist, Colombes, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 21, 1983, Ser. No. 515,752
Claims priority, application France, Jul. 21, 1982, 82 12862
Int. Cl.[4] F28F *3/08*
U.S. Cl. 165—166 **17 Claims**



1. A heat exchange device comprising at least one zone of modular structure, characterized in that said zone consists essentially of stacked lattices which can jointly engage above each other, each lattice being formed of intercrossing a first series and a second series of separate small plates contained in vertical planes, each plate having horizontal upper and lower edges, the small plates extending parallel to one another in the first series being jointly assembled by mutual engagement with the small plates extending parallel to one another in the second series by means of cuts located on at least one of the edges of the small plates of said first series and on the opposite edges of the small plates of said second series, said stacking generating spaces for circulating at least two fluids in heat exchange relationship.

4,612,983

SHEAR TYPE GATE VALVE

Michael A. Karr, Jr., Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Oct. 15, 1985, Ser. No. 787,344
Int. Cl.[4] E21B *29/04*
U.S. Cl. 166—55 **6 Claims**

1. A gate valve for cutting an elongated suspension member extending therethrough, and closing in a well, comprising:

a valve body having a vertical passage therethrough, and adapted to be mounted on a wellhead;

a gate assembly slidably mounted in said valve body for horizontal movement between an open and closed position;

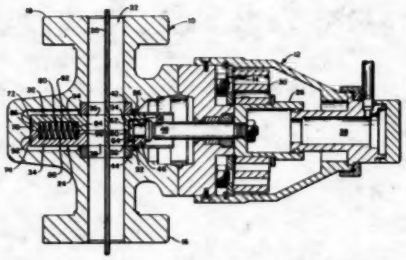
an actuator connected to said gate assembly for moving said gate assembly to and from said open and closed positions;

connection means connecting said actuator and said gate assembly;

said gate assembly comprising an upper gate and a parallel lower gate;

each of said gates having a flow port therethrough alignable with said vertical flow passage in the open position;

said valve body including valve seats adjacent said gate assembly, said valve seats cooperating with said gate



assembly to close said vertical flow passage in a closed position, and at least one of said gates cooperating with one of said seats to seal said vertical flow path in the closed position; and

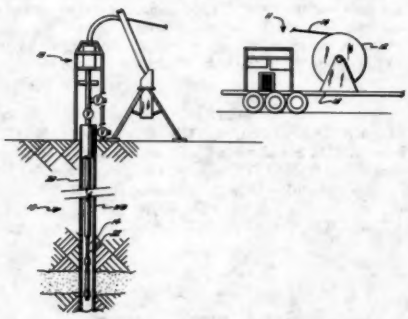
said connection means including a lost motion connection to one of said gates whereby on closing of said valve one of said gates moves ahead of the other so that any elongate member passing through said valve is first sheared by only one gate.

4,612,984

APPARATUS FOR THE RUNNING AND PULLING OF WIRE-LINE TOOLS AND THE LIKE IN AN OIL OR GAS WELL

James B. Crawford, P.O. Box 30636, Lafayette, La. 70503

Filed Feb. 14, 1985, Ser. No. 701,572
Int. Cl.[4] E21B *17/20, 17/042*
U.S. Cl. 166—77 **8 Claims**



1. A carrying tool for supporting wire-line tools with a coil tubing unit would with a continuous length of coil tubing comprising:

a. an elongated tool body having a flow bore for circulating fluid through the tool, which communicates with an opening on the upper end of the tool so that one end of a length of tubing of a coil tubing unit can enter the bore;

b. connection means within the bore for forming a connection between one end of the coil tubing and the tool body defining a first load transfer surface;

c. a second load transfer surface extending linearly from the first load transfer surface along the tool bore and a corre-

sponding length of the coil tubing end that occupies the tool bore;

d. wire-line tool carrying means formed on the lower end portion of the tool for supporting a wire-line tool with the coil tubing unit; and

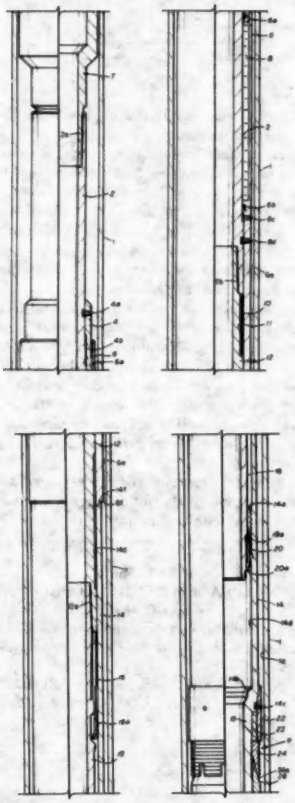
e. circulating bore means for conveying fluid from the coil tubing unit, through the tool body bore and to a position adjacent the wire-line tool so that circulating fluid can wash debris in the well bore from the said position.

4,612,985

SEAL ASSEMBLY FOR WELL TOOLS

Richard P. Rubbo, and David M. Haugen, both of Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jul. 24, 1985, Ser. No. 758,406
Int. Cl.[4] E21B *33/12*
U.S. Cl. 166—114 2 Claims



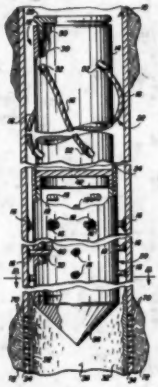
1. A tubing seal assembly adaptable to be stabbed into the bore of a well packer anchored in a subterranean oil or gas well upon insertion of a tubing string into the well bore to establish fluid communication through the packer, comprising: means for attaching the tubing seal assembly to the tubing string; a tubular member extending from the attaching means; seal means disposed about the periphery of said tubular member; a constraining sleeve shearably attached to said tubular member and defining an annular cavity around said tubular member; seal means inserted in said cavity; the volume of the cavity being at least equal to the unrestrained volume of the seal means at the surface of the well, and less than the unrestrained volume of the seal means at the subsurface location of the packer; engagable surfaces respectively provided on said packer and said constraining sleeve to move said constraining sleeve upwardly relative to said tubular member as said seal means is inserted in said packer bore, whereby sealing integrity can be established with the bore of the well packer upon insertion of the tubing seal assembly into the well packer bore without damaging the seal means; and means for continuously damping said upward movement of said constraining sleeve relative to said tubular member.

4,612,986

WELL CLEANING APPARATUS AND TREATING METHOD

Frank D. Fosdick, Jr., 1685 Skyway St., Paradise, Calif. 95916, and Jerald L. Browder, Rt. 1, Box 102, Maricopa, Calif. 93252

Filed Jun. 4, 1984, Ser. No. 616,578
Int. Cl.[4] E21B *37/02*
U.S. Cl. 166—171 27 Claims



1. An improved well cleaning apparatus, said apparatus comprising, in combination:

(a) an elongated implement having a sidewall; and,

(b) a plurality of flexible adjustable wire cable means extending out of a plurality of spaced openings in said sidewall of said implement for releasable engagement with the interior surface of a well casing for removal of deposited scale, sludge, clay, sand, tar, etc., therefrom,

(c) wherein said apparatus includes a first section having a plurality of said cables extending generally outwardly from said implement, and a second section disposed next to said first section and having a plurality of said cables extending outwardly of said implement and disposed in a flexible curved loop-like configuration outside of said sidewall,

(d) wherein said implement includes a closed generally conical bottom plug secured to the bottom of said sidewall.

3. An improved well cleaning apparatus, said apparatus comprising, in combination:

(a) an elongated implement having a sidewall; and,

(b) a plurality of flexible adjustable wire cable means extending out of a plurality of spaced openings in said sidewall of said implement for releasable engagement with the interior surface of a well casing for removal of deposited scale, sludge, clay, sand, tar, etc., therefrom,

(c) wherein said apparatus includes a first section having a plurality of said cables extending generally outwardly from said implement, and a second section disposed next

to said first section and having a plurality of said cables extending outwardly of said implement and disposed in a flexible curved loop-like configuration outside of said sidewall,

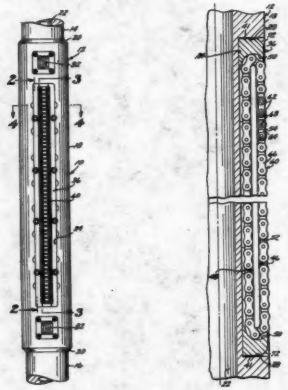
(d) wherein said implement includes a removable top plug secured to the top of said sidewall.

4,612,987

DIRECTIONAL DRILLING AZIMUTH CONTROL SYSTEM

Alton E. Cheek, 1949 Vuelta Grande Ave., Long Beach, Calif. 90815

Filed Aug. 20, 1985, Ser. No. 767,627
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—212 **19 Claims**



1. A downhole anchor assembly for absorbing reaction torque from a downhole mud motor in a directional drill string so as to minimize azimuthal deviation from such reaction torque, said anchor assembly comprising:

an elongated, generally cylindrical housing having upper and lower ends with tool joints thereon for coupling said body into a directional drill string and having a drilling fluid passage extending longitudinally through its length;

at least one elongated chain support body longitudinally mounted in said housing;

an elongated, endless anchor chain supported on said body, said chain having an elongated portion thereof longitudinally arranged and generally radially exposed externally of said body, said exposed chain portion being freely longitudinally movable along said body;

said body being generally radially shiftable between a retracted position in which said exposed chain portion is substantially recessed in said housing and an extended position in which said exposed chain portion extends generally radially outwardly from said housing so as to be engageable along its exposed length against a well casing; and

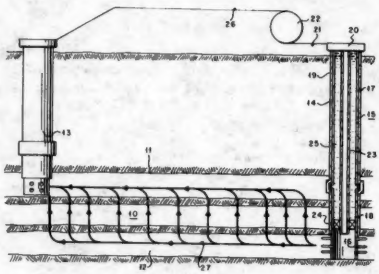
actuating means in said housing engageable with said body for shifting said body from its said retracted position to its said extended position, said actuating means exerting generally radially outwardly directed force on said body for forceable engagement of said exposed chain portion against a well casing.

4,612,988

DUAL AQUAFER ELECTRICAL HEATING OF SUBSURFACE HYDROCARBONS

Daniel J. Segalman, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 24, 1985, Ser. No. 747,752
Int. Cl.[4] E21B *36/04, 43/20, 43/24*
U.S. Cl. 166—248 **6 Claims**



1. A method of electrically heating a viscous hydrocarbon-bearing subsurface formation comprising:

a. applying an electric voltage to a first electrode well extending into a subsurface first aquafer, said first aquafer containing flowable mobile water and having sufficiently high permeability to permit water to be flowed into and out of said first aquafer, said first aquafer extending laterally more than 100 feet from said first electrode well in at least one direction and overlaying said viscous hydrocarbon-bearing subsurface formation;

b. applying an electric voltage to a second electrode well extending into a subsurface second aquafer, said second aquafer containing flowable mobile water and having sufficiently high permeability to permit water to be flowed into and out of said second aquafer, said second aquafer extending laterally more than 100 feet from said second electrode well in at least one direction and underlaying said viscous hydrocarbon-bearing subsurface formation, and

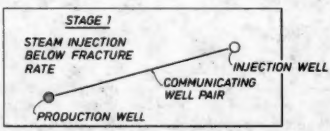
c. causing electric current to flow between said first and second electrode wells and through said viscous hydrocarbon subsurface formation.

4,612,989

COMBINED REPLACEMENT DRIVE PROCESS FOR OIL RECOVERY

Alec Rakach, Sandnes, Norway, and Caurino C. Bombardieri, Calgary, Canada, assignors to Exxon Production Research Co., Houston, Tex.

Filed Jun. 3, 1985, Ser. No. 740,607
Int. Cl.[4] E21B *43/00, 43/24, 43/26*
U.S. Cl. 166—263 **12 Claims**



1. In a process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation which is penetrated by at least one injection well and at least one production well wherein a heated fluid is injected into said hydrocarbon formation through said injection well and fluids are produced from

said production well, the improvement which comprises the following sequence of steps:

(a) injecting said heated fluid through said injection well at a rate less than the rate needed to fracture said formation and producing fluids from said production well until said heated fluid breaks through to said production well;

(b) shutting in said production well after said heated fluid from said injection well breaks through to said production well;

(c) injecting heated fluid into said injection well at a rate at least sufficient to fracture said formation;

(d) ceasing injection of said heated fluid after said formation is suitably heated; and

(e) opening said production well and producing hydrocarbons from said production well.

4,612,990

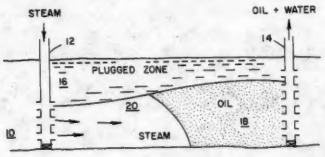
METHOD FOR DIVERTING STEAM IN THERMAL RECOVERY PROCESS

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 518,993, Aug. 1, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,343

Int. Cl.[4] E21B *43/24*

U.S. Cl. 166—272 **21 Claims**



1. A method of recovering viscous oil from a subterranean, viscous oil-containing, permeable formation penetrated by an injection well which is in fluid communication with the lower one-third to one-half of the formation and a prouction well which is in fluid communication with a substantial portion of the formation, comprising:

(a) injecting steam into the formation through the injection well and recovering fluid including oil from the formation by the production well for a predetermined period of time, forming a steam-swept zone and an unswept zone in the formation;

(b) shutting in the production well;

(c) injecting an oxygen-containing gas into the steam swept zone through the injection well in an amount of 0.5 to 1.5 MSCF of oxygen per barrel of residual oil in the steam-swept zone, sufficient to oxidize residual oil in the steam-swept zone and sufficient to form a viscous asphaltic material in that zone, decreasing its permeability until the injection pressure increases; and

(d) thereafter injecting steam only into the formation through the injection well and recovering fluid including oil from said unswept zone of the formation through the production well until the fluid recovered from the production well comprises an unfavorable amount of steam or water.

4,612,991

OIL RECOVERY PROCESS

James E. Shaw, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Mar. 18, 1985, Ser. No. 712,938

Int. Cl.[4] E21B *43/22*

U.S. Cl. 166—273 **9 Claims**

1. A post-primary process for the displacement and recovery of oil from subterranean formations comprising the steps of:

(a) injecting into a crude oil-bearing subterranean formation an aqueous saline surfactant composition comprising (1) brine and (2) at least one acylated polypeptide salt surfactant,

(b) thereafter displacing said aqueous composition through said oil-bearing formation so as to drive oil therefrom, and

(c) recovering oil thus driven from said formation.

4,612,992

SINGLE TRIP COMPLETION OF SPACED FORMATIONS

Roy R. Vann, Katy, Tex., and Emmet F. Brieger, Nogal, N. Mex., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 439,076, Nov. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 384,579, Jun. 3, 1982, abandoned. This application Apr. 10, 1985, Ser. No. 721,536

Int. Cl.[4] E21B *43/1185*

U.S. Cl. 166—297 **17 Claims**

1. A method of perforating two spaced-apart formations, comprising the steps of:

positioning a first perforating gun in a borehole adjacent to a first formation and a second perforating gun in the borehole adjacent to a second formation;

detonating the charges of the first gun to create a pressure shock wave, the pressure shock wave being generated by application of the explosive force from firing the first gun to a movable wall closing one end of a column of fluid;

directing the pressure shock wave to means for detonating the charges of the second gun; and

detonating the charges of the second gun in response to said pressure shock wave.

9. Apparatus for completing a well, comprising:

first perforating means for perforating one portion of the well;

second perforating means for perforating another portion of the well;

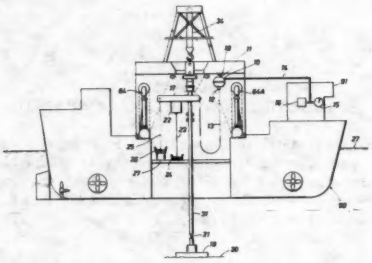
means for transmitting a fluid pulse upon detonation of said first perforating means, said means for transmitting a fluid pulse including a conduit extending between said first and second perforating means and substantially filled with fluid and movable wall means within said conduit for applying pressure to the fluid upon detonation of said first perforating means; and

means for receiving said fluid pulse to actuate the detonation of said second perforating means.

4,612,993
RISER POSITION INDICATION APPARATUS

Boyd B. Moore, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 19, 1984, Ser. No. 651,976
Int. Cl.[4] E21B 7/128; G08B 21/00
U.S. Cl. 166—335 7 Claims



1. Riser Position Indication Apparatus for disposition between an offshore vessel and a riser, said riser being moveable with respect to said offshore vessel, said riser position indication apparatus comprising:

vessel connection means operatively engaged with said vessel to secure said riser position indication apparatus to said vessel,

riser connection means operatively engaged with said riser to secure said riser position indication apparatus to said riser,

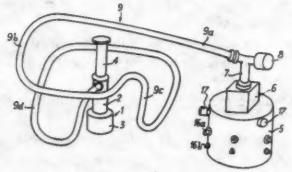
flexible weight means having one end connected to one of said connection means and the other end operatively engaged with the other of said connection means,

weight signal transmitter means associated with at least one end of said flexible weight means and operative to produce a continuous output signal which varies as a function of the weight of said weight means suspended from one end of said connection means.

4,612,994
DEVICE FOR CONNECTING A COLLECTING HEAD INPUT TO THE WELL HEAD OUTPUT BY MEANS OF A MOBILE CONNECTOR CONNECTED TO A LOOPED DUCT

Yvon Castel, and Michel Iato, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jul. 16, 1984, Ser. No. 631,227
Claims priority, application France, Jul. 26, 1983, 83 12331
Int. Cl.[4] E21B 43/013, 43/01
U.S. Cl. 166—344 14 Claims



1. In a device for connecting a collecting head input having a distribution block and handling arbor to a well head output by means of a movable connector having an axis forming part of the equipment of a connection module and connected to the distribution block of the collecting head by means of a looped duct, the provision of;

a flexible connectiong coupling formed by two horizontal loops surrounding the distribution block at different levels and connected together by a rectilinear vertical duct portion for guiding the movable connector towards a receptacle-connector having an axis placed on the well head output,

said movable connector resting on a fork integral with a lever hinged by means of a swivel joint so as to allow lateral deflecting and rotary movements, an intermediate point of the lever resting on one end of a hydraulic cylinder provided with a swivel joint, the other end of the hydraulic cylinder resting on the module being also hinged by means of a swivel joint so as to allow height adjustment of the fork,

said movable connector having at its periphery radial guide rollers cooperating with inclined input ramps defining a throat therebetween with which the receptacle connector is provided and grouped in pairs of superimposed upper and lower rollers,

the lower roller having a diameter less than that of the upper roller, the spacing apart of the input ramps having a width greater than that of the throat of the ramps so that, when the upper rollers bear on at least two opposite input ramps, positioning in a vertical plane is obtained and when, following lowering of the fork, a pair of lower rollers are engaged at the bottom of the ramps, the coincidence of the axes of the movable connector and of the receptacle connector is attained.

5. In combination with a connecting module for interconnecting fluid outputs from a connector receptacle on a well head to a collecting head on the module, the provision of:

a flexible connecting coupling means comprising

a duct means connected at one end to the collecting head;

a movable connector connected to the other end of said duct means;

said duct means including horizontally disposed spaced loops and a vertically disposed duct portion;

and guide means on the module for aligning the movable connector with the connector receptacle;

said guide means including

fork means connected with the movable connector for relative movement of the movable connector with respect thereto in one direction;

lever means carrying said fork means and mounted on said module for vertical and lateral movement of the fork means and connector;

and means on the connector receptacle cooperable with means on said movable connector for positioning said movable connector in said receptacle in axial alignment therewith.

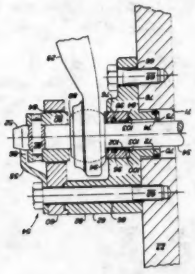
4,612,995
DRAFT VEHICLE WITH LOAD SENSOR AND REMOVABLE SUPPORT

Vasile Benedek, Brühl; Volker Hückler, Radolfzell, and Hilmar S. Ortlepp, Mannheim, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Oct. 22, 1984, Ser. No. 663,291
Claims priority, application European Pat. Off., Oct. 25, 1983, 83110621.6
Int. Cl.[4] A01B 63/112
U.S. Cl. 172—7 4 Claims

1. In a draft vehicle having a load sensing and adjusting system which includes a bending bar extending transversely through a casing forming part of the vehicle and is slidably supported at opposite sides of the casing by spherical bearing members removably mounted on the opposite sides of the casing, and draft links attached adjacent to the outer ends of the bar outboard of the bearings members whereby a load on the draft links causes said bar to bend and slide within and pivot on said bearing members, the improvement comprising: each bearing member is carried by one leg of an L-shaped support which is removably secured to the side of the vehicle with the other leg thereof extending outwardly from the cas-

ing; a deflection limiting member is attached to the outwardly extending leg of each L-shaped support, each deflection limiting member being provided with an aperture positioned over the corresponding outer end portion of the bar and engageable



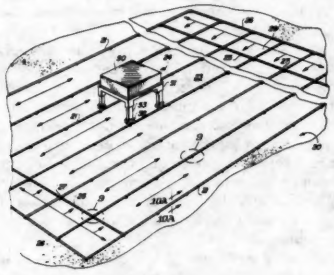
therewith upon a predetermined maximum bending of the bar, the aperture in each bar having a dimension in the nominal direction of movement of the bar greater than the dimension of the bar in the same direction.

4,612,996

ROBOTIC AGRICULTURAL SYSTEM WITH TRACTOR SUPPORTED ON TRACKS

Rodney A. Wolf, Amherst Junction, and Alan G. Zech, Viroqua, both of Wis., assignors to Kimberly Hills, Ltd., Chicago, Ill.

Filed Aug. 8, 1983, Ser. No. 521,611
Int. Cl.[4] A01B *69/00*
U.S. Cl. 172—26 **5 Claims**



1. A robotic agricultural assembly comprising:

rail tracks with means on the bottom of said tracks for suspending said tracks above substantially the entire area of a crop field, said tracks being straight and parallel over their length and defining parallel rows;

a first pair of spaced apart, parallel tracks perpendicular to said rail tracks and having substantially the same elevation as said rail tracks and defining a first end margin of said parallel rows;

a second pair of spaced apart, parallel tracks perpendicular to said rail tracks and having substantially the same elevation as said rail tracks and defining a second end margin of said parallel rows;

a robot tractor positioned on said tracks and adapted to reciprocally travel over the rail tracks and switch between adjacent pairs of said rail tracks by moving over said perpendicular tracks at the end of each row defined by said rail tracks;

said tractor including a carriage frame having a leg suspended from each corner thereof, each of said legs comprising an upper portion fixed to the carriage frame and a lower moveable portion, elevating means attached to and cooperating with said upper and lower leg portions to expand and contract the length of the tractor legs whereby said carriage frame height can be varied, each of said tractor legs having a first set of tandem wheels attached to a bottom portion of the lower leg portion and which travel over said rail tracks and a second set of tandem wheels perpendicular and criss-cross to said first set of wheels and which travel over said perpendicular tracks to reach an adjacent pair of said rail tracks when said tractor reaches the end of one row defined by said rail tracks;

said second set of tandem wheels being retracted when said tractor is riding over said rail tracks;

said first set of tandem wheels being retracted when said tractor is riding over said perpendicular end tracks;

said wheels having flanges for travel over said tracks;

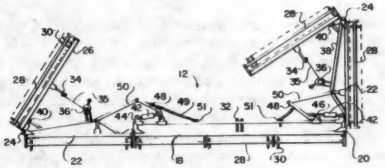
said tracks comprising uniform length units of straight track and perpendicular crosses of intersectional track having depressions at their intersections of sufficient length that when the tractor tandem wheels meet one of the depressions during travel, one of said tandem wheels is in said one of said depressions while the other wheel is supported by the tracks, thereby avoiding interrupted horizontal movement as each wheel crosses said track intersection.

4,612,997

SAND FIGHTER WITH FOLDING FRAME

Walter B. Wilkins, Lubbock, Tex., assignor to Phares and Wilkins Mfg. Co., Lubbock, Tex.

Filed Jul. 2, 1985, Ser. No. 751,326
Int. Cl.[4] A01B *63/04, 63/102, 73/04*
U.S. Cl. 172—776 **2 Claims**



1. In a sand fighter adapted to be drawn in a direction of draft by a tractor having a source of hydraulic fluid under pressure, having:

a. a plurality of contiguous frame sections,

b. each frame section hinged to the section adjacent to it,

c. a shaft journaled to each frame section, and

d. a plurality of earth working kickers attached to each shaft,

e. so arranged and constructed that with all the frame sections extended the respective shafts are substantially coaxial and normal to the direction of draft;

the improved structure comprising:

f. one of the frame sections being a medial section,

g. hitch means on the medial section for attaching the sand fighter to power lift draft bars of a tractor,

h. the frame sections hinged at each end of the medial section being proximal sections,

i. the hinges connecting the medial section and each proximal section being the proximal hinges,

j. two hydraulic cylinders, each of which is near one of said proximal hinges on the medial section,

k. each of the hydraulic cylinders mechanically connected to

l. an arm pivoted to the medial section,

m. a pitman connecting the arm to the proximal section,

n. each hydraulic cylinder adapted to be fluidly connected to the source of hydraulic fluid on the tractor,

o. a chain extending from the arm to

p. a chain holder on the medial section inboard of the arm,

said chain and holder being so arranged and constructed to selectively prevent excessive drooping of the proximal section when extended and to selectively hold the proximal section secure when folded,

q. the frame sections hinged to the proximal sections being distal sections,

r. the hinges connecting the proximal and distal sections being distal hinges, and

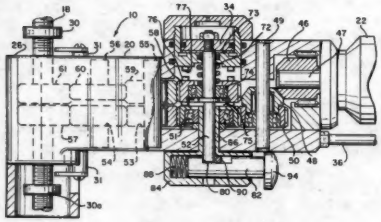
s. manual lift means on each of the distal and proximal sections for manually lifting the distal sections about the distal hinges.

4,612,998

RETRACTING POSITIVE FEED DRILL WITH IDLE MODE

Pierre G. Vindez, Redondo Beach, Calif., assignor to P. V. Tool, Inc., Gardena, Calif.

Filed Jul. 12, 1984, Ser. No. 630,325
Int. Cl.[4] B23B *47/22*
U.S. Cl. 173—19 **5 Claims**



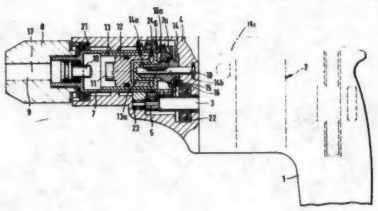
1. An idle system for a positive feed drill having a spindle drive gear train and a spindle feed gear train coupled to the drive gear train by side teeth on respective drive and feed coupling gears mounted on a common shaft, wherein the journal for said feed coupling gear is over a flange that is integral with said shaft, a spring between said feed coupling gear and a housing for said gear trains to bias said feed coupling gear against said flange, and thereby bias said shaft to a position where said feed coupling gear is coupled to said drive coupling gear, fixed teeth on said housing for engagement with teeth on said feed coupling gear on the side thereof opposite said drive coupling gear, actuatable means for moving said shaft against said spring to disengage said feed coupling gear from said drive coupling gear and lock said feed coupling gear against said fixed teeth to retract said spindle, and upon deactuation of said actuatable means to automatically allow said feed coupling gear to be disengaged from said fixed teeth, an idle system comprising spring biased means, responsive to said shaft being moved to a position for said feed coupling gear to engage said fixed teeth upon actuation of said actuatable means, for limiting the return of said shaft upon deactuation of said actuatable means once said actuatable means has been actuated to move said shaft and feed coupling gear into locking position of said feed coupling gear, said spring biased means having a slot a dimension of which limits the return of said shaft so that said feed coupling gear is disengaged from said fixed teeth and not re-engaged with said teeth of said drive coupling gear until said spring biased means is manually reset, wherein said spring biased means is comprised of a disk rotateable on an axis parallel to the axis of said shaft, and a spring which rotates said disk on said axis spaced from the axis of said shaft a distance less than the radius of said disk, a cutout sufficient to accommodate said shaft, a slot in said shaft of a depth sufficient for said disk to be rotated with the cutout thereof away from said shaft, thereby placing said disk in said slot to prevent a full return of said shaft, the length of said slot determining the extent of return until said disk is manually reset with its cutout aligned with said shaft, and a coiled torsion spring for automatically rotating said disk from said aligned position when said shaft is moved to place the slot thereof in alignment with said disk.

4,612,999

PERCUSSION TOOL

Otto Bergler, Mühlacker-Lomersheim, Fed. Rep. of Germany, assignor to Black & Decker Overseas AG, Vaduz, Liechtenstein

Filed Jun. 19, 1984, Ser. No. 622,271
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322964
Int. Cl.[4] B25D *16/00*
U.S. Cl. 173—109 **8 Claims**



1. A percussion tool comprising:

a housing having a front end for receiving a tool,

a motor mounted in said housing,

a strike bolt aligned longitudinally with said tool and being reciprocable in a longitudinal direction behind said tool for impacting thereagainst,

a piston aligned longitudinally with said strike bolt and being longitudinally reciprocable behind said strike bolt for impacting thereagainst, impact drive means for imparting reciprocable movement to said piston toward said strike bolt, comprising

guide means aligned longitudinally with said piston and mounted for longitudinal reciprocation, said guide means being operably connected to said piston to reciprocate said piston when said guide means is reciprocated,

a wobble member mounted on an outer periphery of said guide means for rotation about an inclined axis disposed at an acute angle relative to said longitudinal direction,

a drive member rotatably driven by said motor about a longitudinal axis aligned with said guide means and being coupled to said wobble member to rotate the latter about said inclined axis, and

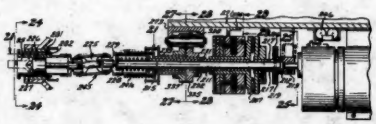
means preventing rotation of said guide means so that rotation of said wobble member about said inclined axis produces longitudinal reciprocation of said guide means and said piston.

4,613,000

APPARATUS FOR FASTENING MISALIGNED STRUCTURAL MEMBERS

Raymond J. Moore, 533 Wayland Ct., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 88,612, Oct. 26, 1979, Pat. No. 4,309,123. This application Oct. 19, 1981, Ser. No. 312,505
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—163 **8 Claims**



1. A power tool for aligning eccentric nested bushings over

a fastener opening and advancing a fastener into the common interior thereof, comprising:

a motor provided with a rotary output shaft;

a drive shaft operatively connected at one end to said output shaft for common rotation therewith;

a first tubular carrier concentrically aligned over said drive shaft;

clutch means deployed between said output shaft and said first tubular carrier for selective engagement thereof;

a second tubular carrier concentrically mounted over a portion of said first tubular carrier;

gearing means connected between said first and second tubular carrier;

a fastener driver operatively connected to the other end of said drive shaft; and

a first and second bushing driver concentrically mounted around said fastener driver and respectively connected for common rotation with said first and second carrier for engaging respective ones of said bushings for advancement thereof in rotation.

4,613,001

WEATHER PROTECTED OFFSHORE DRILLING RIG

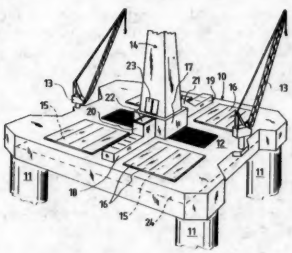
Nils Edberg, Göteborg; Ivar Kores, Mölndal; Gottfrid Holmkvist, Västra Frölunda, and Rickard Helmerson, Göteborg, all of Sweden, assignors to Gotaverken Arendal AB, Sweden

Filed Aug. 13, 1984, Ser. No. 639,990

Claims priority, application Sweden, Sep. 21, 1983, 8305080

Int. Cl.[4] E21B *19/14, 15/00;* **B63B** *35/44*

U.S. Cl. 175—52 **4 Claims**



1. A drilling rig comprising a main deck having pipe storage racks as well as a superposed drill deck mounting a derrick for the drilling equipment,

closable openings in said drill deck for supplying pipes into said pipe racks,

a protecting enclosure around said derrick,

at least one transport passage on said drill deck, extending away from said enclosed derrick, and located in a raised tunnel structure, which communicates with said underlying main deck, and

a raised enclosure adjacent to said enclosed derrick permitting pipes to be swung from a horizontal to a vertical position during transfer from said tunnel to said derrick, and

transport means for the vertical displacement of pipes between said decks, as well as for horizontal displacement along both said decks.

4,613,002

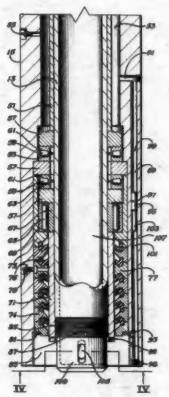
DOWNHOLE DRILLING TOOL WITH IMPROVED SWIVEL

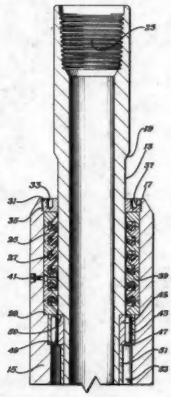
Paul R. Pittman, Round Rock; Floyd L. Scott, Jr., and William R. Hamilton, both of Austin, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Apr. 30, 1984, Ser. No. 605,536

Int. Cl.[4] E21B *4/02*

U.S. Cl. 175—107 **3 Claims**





1. A swivel for use with a downhole well drilling motor, said swivel comprising:

a tubular stem adapted to be connected to a drill string;

a tubular housing, mounted concentrically and rotatably on the stem, forming an annular space between the housing and the stem, said housing being adapted to connect to the downhole well drilling motor;

bearing means within the annular space for supporting the housing against radial and longitudinal thrust loads;

seal means within the annular space, above and below the bearing means, for forming a lubricant chamber, said housing having a cylindrical lubricant passage, one end of the passage communicating with the lubricant chamber, and the other end of the passage communicating with the annular space outside of the lubricant chamber, and the passage having a longitudinal axis laterally offset from the longitudinal axis of the housing; and

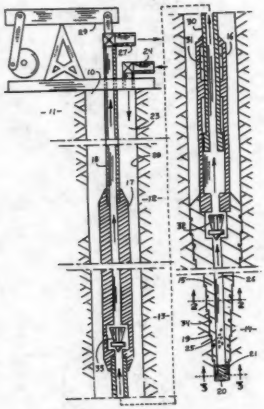
a cylindrical piston sealably slidable within the lubricant passage in response to pressure of drilling fluid entering the lubricant passage from the annular space to force lubricant out of the passage and into the chamber in order to replace lubricant which is lost therefrom.

4,613,003

APPARATUS FOR EXCAVATING BORE HOLES IN ROCK

James L. Ruhle, 2535 E. Balfour Ave., Fullerton, Calif. 92634

Filed May 4, 1984, Ser. No. 607,009
Int. Cl.[4] E21B *4/06*
U.S. Cl. 175—324 **1 Claim**



1. A borehole excavation apparatus having a passageway therethrough comprising:

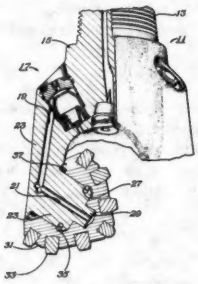
a rocker beam with connecting means suitable for supporting and vertically oscillating a pipe for drilling a borehole, said pipe being nonmetallic composite pipe, a cylindrical weighted momentum unit supported by and coupled to the bottom of said composite pipe, a downhole positive displacement pump having top and bottom portions with means for connecting the pump to said cylindrical weighted momentum unit, said pump comprising a housing, a movable tubular plunger disposed inside said housing, seal means disposed inside said housing at the top portion of and circumferentially around said plunger, a standing valve in said passageway and disposed adjacent to said bottom portion, a travelling valve in said passageway disposed above said standing valve, an excavation tool with means for connecting to said downhole positive displacement pump, said tool comprising an array of side-mounted blades, a distally-mounted tubular shoe shut-off connected to said tool at the bottom end thereof, an array of distally-positioned suction ports through said shoe shut-off, and an array of distally-mounted impact blades on said shoe, said passageway conveying drilling fluid and excavated rock chips upward through the excavation tool upon operation of said apparatus.

4,613,004

EARTH BORING BIT WITH LABYRINTH SEAL PROTECTOR

Duane E. Shotwell, Houston, Tex., assignor to Hughes Tool Company - USA, Houston, Tex.

Filed Nov. 6, 1985, Ser. No. 795,574
Int. Cl.[4] E21B *10/22*
U.S. Cl. 175—371 **2 Claims**



1. An earth boring bit having an improved seal protector, which comprises:

a bit body having at least one head section with a cantilevered bearing shaft extending from its base generally inwardly and downwardly to form a bearing surface;

an earth disintegrating cutter rotatably secured to the bearing shaft, with a radial backface positioned over the base of the shaft;

the cutter having an annular seal groove formed in the backface to oppose the base of the bearing surface;

seal means positioned in the annular seal groove;

a seal protector groove formed in the cutter backface, with a radially extending, base portion positioned outwardly from the seal groove and a generally axially extending, shelf portion positioned outwardly of the seal groove;

a seal protector ring, generally L-shaped as seen in cross section, with an annular body and an annular lip, to register respectively with the base the shelf portions of the seal protector groove;

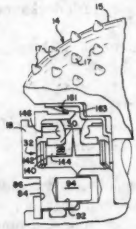
whereby the seal means is protected from ambient detritus.

4,613,005

UNITIZED SEAL FOR SEVERE SERVICE APPLICATIONS

Burton K. Olsson, Park Ridge, Ill., assignor to Chicago Rawhide Manufacturing Co., Elgin, Ill.

Filed Jun. 20, 1984, Ser. No. 622,621
Int. Cl.[4] E21B *10/22*
U.S. Cl. 175—371 **13 Claims**



13. A sealed earth boring drill bit assembly comprising, in combination, a rotary drill bit having a contoured, exterior

earth-engaging surface portion, a central bore therein for reception of a mounting bearing, and a counterbore for receiving a seal casing, a drill bit spindle providing a rotary axis for said drill bit, and a bearing disposed between said bit bore and said spindle, a seal unit disposed between said spindle and a portion of said bit, with a lubricant-receiving cavity being defined in part between said spindle, said bit and the interior of said seal, said seal unit including a casing unit for carrying a first half seal assembly and a cover unit for carrying a second, substantially identical half seal assembly in opposed facing relation to said first half seal assembly, said casing and said cover being in opposed, spaced apart relation and having thereon mutually interlocking means preventing unintentional axial disassembly of said seal and permitting free rotation of said casing and cover with respect to each other, and free but limited relative axial movement therebetween in the use of said seal, said casing unit being received in said drill bit counterbore, means on at least one interior surface of said casing for receiving and positioning an annular secondary seal element in fluid tight relation, and means on said casing for receiving and positioning an axially compressible mechanical spring, said cover being of annular form, being received over said spindle and locked against unintentional removal therefrom, said cover having at least one interior surface for receiving and positioning a portion of an elastomeric secondary seal ring in fluid tight relation to said cover, and means in said cover for receiving and positioning an axially acting spring forming a part of said half seal, and axially inner and outer, substantially identical half seal units carried respectively by said casing and said cover, each half of said seal units including a primary seal ring of generally L-shaped cross-section and having a seal band forming surfacc on one end face surface of its radial flange, a secondary seal seat formed by the combination of the radial surface lying opposite said seal band surface, and one of the axial surfaces defining part of said primary ring, said primary ring also including an end face surface extending between radially inner and outer surfaces defining said axial flange, a secondary seal unit of annular form and generally U-shaped cross-section having radially inner and outer axial flanges joined to each other at a radially extending bight portion, with the outer axial flange being received within the receiving and positioning surface of its associated carrier and with the adjacent axial and radial surfaces of the secondary seal unit engaging said seat in fluid tight relation, and an axially acting mechanical spring disposed between said end face portion of said primary ring axial flange and a portion of its associated carrier, with said mechanical springs thereby urging said primary seal band surfaces into snug, relatively rotatable primary sealing engagement with each other to retain lubricant in said cavity.

4,613,006

ENDLESS BELT DRIVEN CYCLE

Alvin Moss, 3 Gushue Avenue, New Town, Mount Pearl, Newfoundland, A1N 2R2; Charles G. Shepherd, P.O. Box 46, Oakville, Ontario, L6J 4Z5; Craig G. Malcolm, 46 Autumn Drive, Caleson, Ontario L0N 1C0; Richard E. Malcolm, 432 Drummond Road, Oakville, Ontario L6J 4L4, and Peter J. Schmitz, 1547 Stavebank Road, Mississauga, Ontario L5G 2V6, all of Canada

Filed Feb. 6, 1984, Ser. No. 577,399

Int. Cl.[4] B62D *55/06*

U.S. Cl. 180—9.25 **8 Claims**

1. A ground-support vehicle, comprising:

a vehicle frame having front and rear ends;

a seat mounted on the frame;

a ground engagement member supporting a front end of the frame;

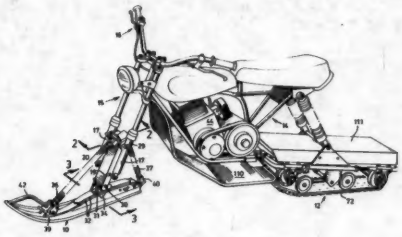
a steering mechanism coupled to front end of the frame for steering the ground engagement member;

a track assembly including an endless flat drive track having upper and lower runs;

means coupling the track assembly to the frame and including a horizontal pivotal connection between a forward part of the track assembly and the frame intermediate the front and rear ends of the frame for providing pivotal movement between the track assembly and the frame, the lower run of the track normally being inclined upwardly and forwardly;

drive means on the frame coupled to the drive track; and

a plurality of cleats attached to the flat drive track and



spaced apart along an outer surface of the drive track, each of the cleats extending transversely of the track and having a height, perpendicular to the outer surface of the track which increases from opposite side edges of the outer surface to the longitudinal centerline of the outer surface so that each of the cleats has a convexly curved outer peripheral surface.

4,613,007

MULTI-FUNCTION STARTER DEVICE

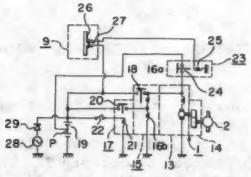
Toshinori Tanaka, and Akira Morishita, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,157

Claims priority, application Japan, Oct. 20, 1983, 58-163890[U]

Int. Cl.[4] H02J *1/00*

U.S. Cl. 180—89.15 **5 Claims**



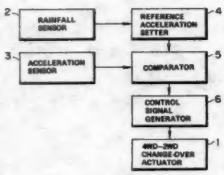
1. A multi-function starter device comprising a starter motor mounted on an engine, an oil pump connected to said starter motor to drive an auxiliary device, characterized in that said oil pump is always connected to said starter motor to be rotated and an oil pressure switching valve to be manually operated is provided in a pipe at the discharge side of said oil pump, wherein said oil pressure discharging valve is connected to the side of an oil refluxing path at the time other than driving of said auxiliary device and upon shutdown of said device, and is switched to a pipe communicated with an actuator at the time of driving said auxiliry device and whereby when said switching valve is placed in a neutral position oil pressure is reduced in said auxiliary device.

4,613,008

2WD-4WD CHANGE-OVER CONTROL SYSTEM RESPONSIVE TO RAINFALL AND ACCELERATION

Kazuyoshi Hiraiwa, Atsugi, and Akihiko Muraoka, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 10, 1985, Ser. No. 807,314
Claims priority, application Japan, Dec. 12, 1984, 59-262219
Int. Cl.[4] B60K *17/34*; B62D *1/24*
U.S. Cl. 180—247 **6 Claims**



1. A control system for a four wheel drive vehicle, comprising:

means for sensing a rainfall,

acceleration sensing means for sensing acceleration and deceleration of the vehicle,

control means connected with said rainfall sensing means and said acceleration sensing means for generating a 2WD command signal if an actual acceleration sensed by said acceleration sensing means is smaller than a reference acceleration determined in accordance with said rainfall sensed by said rainfall sensing means or if an actual deceleration sensed by said acceleration sensing means is smaller than a reference deceleration determined in accordance with the rainfall sensed by said rainfall sensing means, and a 4WD command signal if said actual acceleration is greater than said reference acceleration or if said actual deceleration is greater than said reference deceleration, and

actuating means connected with said control means for changing a drive system of the vehicle to a two wheel drive mode when said 2WD command signal is generated by said control means, and to a four wheel drive mode when said 4WD command signal is generated by said control means.

4,613,009

WHEEL SUPPORTING STRUCTURE FOR RIDING TYPE WORKING VEHICLES

Kenji Nakamura, and Tatsuhiko Miura, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,861
Claims priority, application Japan, Aug. 24, 1984, 59-175993; Sep. 14, 1984, 59-193325; Feb. 14, 1985, 60-18303[U]
Int. Cl.[4] B60G *19/06*; B62D *7/06*
U.S. Cl. 180—253 **7 Claims**

1. A wheel supporting structure (**200, 300, 400**) for a riding type working vehicle (**1**) including

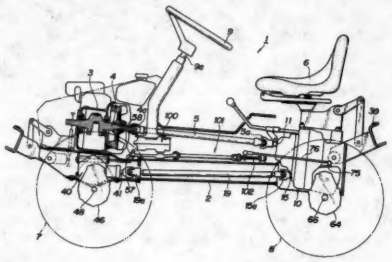
a vehicle body (**2**) provided with a ground wheel (**7, 8**), comprising:

a knuckle holder (**80, 90**) fixed to said vehicle body (**2**);

said knuckle holder (**80, 90**) being formed with a plurality of fixing holes (**83, 84, 85, 93, 94, 95**) vertically spaced apart from each other;

a knuckle (**55, 73**) for supporting said ground wheel (**7, 8**);

an arm member (**59, 77**) vertically swingably pivoted at one end thereof on a portion of said vehicle body (**2**) including said knuckle holder (**80, 90**) and pivotally connected at the other end thereof to said knuckle (**55, 73**); and



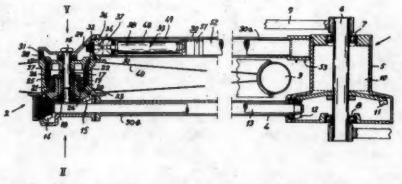
a bolt (**99, 309**) for fastening to fix said knuckle (**55, 73**) selectively to one of said fixing holes (**83, 84, 85, 93, 94, 95**).

4,613,010

POWER TRANSMISSION SYSTEM FOR A BICYCLE

Ake Enocson, Moheda S-340 60, Sweden

PCT No. PCT/SE84/00117, § 371 Date Dec. 4, 1984, § 102(e) Date Dec. 4, 1984, PCT Pub. No. WO84/04076, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 12, 1984, Ser. No. 689,046
Claims priority, application Sweden, Apr. 12, 1983, 8302022
Int. Cl.[4] B62M *1/06*
U.S. Cl. 280—260 **8 Claims**



1. A mechanical and electric power supply and transmission system for a bicycle of the type having a frame connected to a crank housing (**1**) for a crank-and-pedal means (**9**) and from said crank housing a projecting bottom fork (**30**) carrying the drive wheel (**3**) over a drive hub (**2**) at the outer end thereof and having mechanical power transmission means between said crank housing (**1**) and said drive hub (**2**) comprising a drive shaft (**30**), which is enclosed in one bottom fork tube (**30*b***), and which at both ends is connected to angle geras (**11, 12,** and **14, 15**) respectively at the crank housing (**1**) and the drive wheel (**3**), characterized in that:

the crank housing means (**1**) with the drive wheel hub (**2**) and the bottom fork (**30**) provide a solid integral unit on which the bicycle is built up,

drive wheel hub (**2**) is formed for free rotation having an axially movable double conical drive and brake sleeve (**21**) which upon pedalling in one direction is moved in one axial direction and is thereby connected to the drive wheel hub (**2**) providing a drive connection, and which upon pedalling in the opposite direction provides friction braking of the hub,

the hub also includes a hub sleeve (**22**) having a conical portion engageable by said sleeve (**21**) to drive the hub and drive wheel (**3**), and the hub further includes a stationary brake cone (**28**) and an axially movable brake band (**25**) having oppositely oriented conical portions respectively engageable with said sleeve (**21**) and said brake cone (**28**),

and the electric power supply means comprises an electric generator (33) which is connected to and driven by the drive wheel hub.

4,613,011

VEHICLE KING PIN AND DRIVE ASSEMBLY

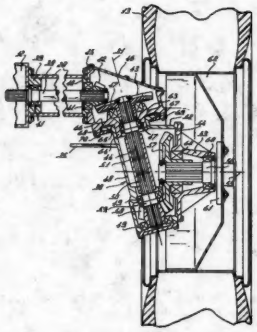
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,642

Claims priority, application Netherlands, Oct. 11, 1982, 8203923

Int. Cl.[4] B60K *17/30*

U.S. Cl. 180—261 21 Claims



1. A vehicle comprising at least one ground wheel which is mounted on a king pin assembly for movement about a king pin axis, said king pin assembly comprising weight bearing housing means which is supported from axle means of said wheel, said wheel being on the outboard side of said housing means, said housing means providing the sole and direct support from said wheel for the vehicle, a drive shaft assembly in said housing means which drivably interconnects an engine of the vehicle to said axle means, said drive shaft assembly comprising two aligned drive shafts, and connection means between said drive shafts which is so constructed and arranged to transmit rotary motion only from one of said drive shafts to the other without significantly restricting relative axial motion between them or contributing to the vehicle's support.

4,613,012

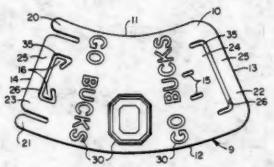
ARTICLE OF ROLLED FORM

John B. Mueller, III, Newark, Ohio, assignor to The Little Screamer Group Limited, Mansfield, Ohio

Filed Apr. 29, 1985, Ser. No. 728,573

Int. Cl.[4] G10K *11/00*

U.S. Cl. 181—178 6 Claims



1. An article of rolled form comprising:

(a) a planar card like semi-rigid material means having opposite and opposing ends and opposite and opposing edges with at least one slit near one edge and at least one tab near the other edge, and one or more other tabs on each edge near each end, with each edge having complimentary handle means cut from the material element; and

(b) having a rolled construction at assembly of circular cross sectional shape between the ends with the edges overlapped and the at least one tab engaged in the at least one slit to retain the article in assembly, with one or more tab on each end inserted within the roll of the other end to restrain the article in generally circular cross sectional shape, each handle means being folded to laterally protrude from a side of the article and to press against the other handle.

4,613,013

SUSPENSION LADDER

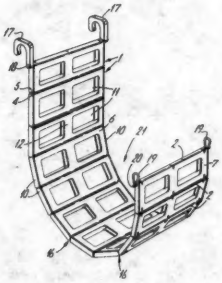
Nigel C. Watling, Picketts Hill House, Picketts Hill, Headley, Nr. Bordon, Hampshire, England

Filed Sep. 6, 1985, Ser. No. 773,214

Claims priority, application United Kingdom, Sep. 13, 1984, 8423102

Int. Cl.[4] E06C *1/383, 1/52, 7/08*

U.S. Cl. 182—20 11 Claims



1. A suspension ladder comprising a string of substantially rigid sections which form the rungs of the ladder and which are hinged together about a series of parallel axes so that the ladder is flexible on both sides of the ladder when the ladder is suspended substantially vertically from its upper end, and stops for limiting the extent to which adjoining sections can pivot towards each other on one side of the ladder so that the ladder can be folded on said one side about said axes to, but not beyond, a predetermined mimimum radius of curvature at which several of the sections together define a cradle adapted to embrace and support confortably the torso of a human body.

4,613,014

OIL CHANGING AND LUBRICATING APPARATUS

Serge D. Millet, 40 Rongail St., Nepean, Ontario, Canada K2G 0K4

Continuation-in-part of Ser. No. 500,459,, Jun. 2, 1983, Pat. No. 4,508,195. This application Mar. 28, 1985, Ser. No. 717,032 The portion of the term of this patent subsequent to Apr. 2,2002, has been disclaimed.

Int. Cl.[4] F01M *11/04;* F16N *25/00*

U.S. Cl. 184—1.5 11 Claims

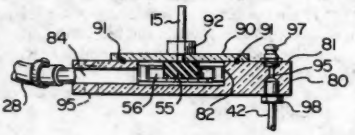
1. A housing for an oil changing and lubricating system for a vehicle, said housing cooperating with impeller means to define therewith a pump, said housing comprising:

(a) a cavity formed therein to receive said impeller means, said cavity being adapted to cooperate with said impeller means to induce a pumping action upon rotation of said impeller means;

(b) an inlet and outlet port each opening through said housing into said cavity for fluid communication therewith;

(c) an outer portion having a plurality of apertures formed

therethrough, each of said apertures being adapted to fixedly receive grease fittings therein; and



(d) cover means to cover and seal said cavity when said impeller means are disposed therein.

4,613,015

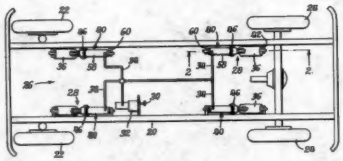
SELF ENERGIZING EMERGENCY BRAKE AND ANTI-SIDE-SKID APPARATUS

James R. Skrzypek, #1 Tricia La., Barrington Hills, Ill. 60010

Filed Jun. 22, 1984, Ser. No. 623,505

Int. Cl.[4] B60T *1/14*

U.S. Cl. 188—6 **5 Claims**



1. Self-energizing emergency drag brake and anti-side-skid apparatus for an automotive vehicle having a frame with front and rear wheels at opposite ends thereof comprising:

a support member pivotally mounted on the frame adjacent each wheel for forward and backward swinging movement between an emergency braking position and a stowed, non-braking position;

a leg member extending downwardly from each support member and telescopically connected thereto for slidable movement along a working axis;

each leg member having its said working axis simultaneously sloping downwardly at a predetermined acute angle relative to the vertical toward the opposite end of the frame when its corresponding support member is disposed in its said emergency braking position;

each said leg member, further, having its said working axis sloping at an angle greater than said predetermined acute angle toward the opposite end of the frame when its corresponding support member is disposed in its said stowed non-braking position;

a foot member with ground-engaging teeth at the bottom of each leg member, and each leg and foot member being of sufficient length to engage the ground when the support members are in their emergency braking positions;

hydraulic cylinder and piston means connected between each of the support members and the frame and actuatable to move the support members concurrently between their stowed, non-braking positions and their emergency braking positions;

stop means positively limiting the swinging movement of the support members at opposite ends of a range between said braking and non-braking positions; and

elastic member interposed between the support members and corresponding leg members effective to press said teeth downwardly against the ground when the support members are in said emergency braking positions.

4,613,016

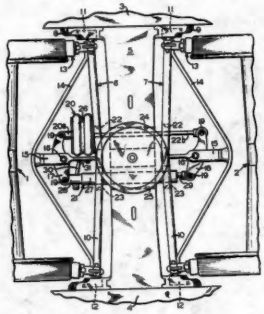
SINGLE-CYLINDER TRUCK-MOUNTED BRAKE ASSEMBLY

James E. Hart, Trafford; William K. Mong, North Huntingdon; Allen W. Kyllonen, Plum Boro, and Mark S. Krampitz, Hunker, all of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Aug. 9, 1985, Ser. No. 764,047

Int. Cl.[4] B61H *13/24*

U.S. Cl. 188—52 **13 Claims**



1. A brake rigging for a railway car truck having a pair of wheel/axle units comprising:

(a) substantially parallel, spaced-apart brake beams interposed between said pair of wheel/axle units and having brake shoes carried thereon adjacent the respective wheel treads of said wheel/axle units for engagement therewith when said brake beams are moved apart;

(b) first and second equalizing levers, each being pivotally-connected at a point intermediate the ends thereof to one of said brake beams at the midpoint thereof;

(c) first force-transmitting means connected between corresponding arms of said first and second equalizing levers including a force actuator for effecting rotation of one of said first and second equalizing levers; and

(d) second force-transmitting means connected between the other arms of said first and second equalizing levers for effecting rotation of the other of said equalizing levers in response to said rotation of said one equalizing lever, whereby a force is exerted on said brake beams at said pivotal connection of said first and second equalizing levers therewith to urge movement of said brake beams in opposite directions and accordingly urge said brake shoes into engagement with the wheel treads of said wheel/axle units.

4,613,017

DISK BRAKE AND METHOD OF ASSEMBLY

Lowell D. Bok, Anna, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

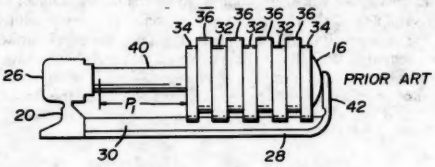
Filed Jul. 2, 1984, Ser. No. 627,364

Int. Cl.[4] F16D *55/02, 69/00*

U.S. Cl. 188—71.7 **4 Claims**

1. A method of assembling and overhauling a disk brake having a plurality of disks with available wear portions of predetermined different thicknesses comprising positioning a first group of said disks in overlapping relationship with a second group of said disks, said first group of said disks having each of said available wear portions of a first thickness, said second group of said disks having each of said available wear portions of a second thickness, said first thickness of each of said available wear portions of said first group of said disks being less than said second thickness of each of said available wear portions of said second group of said disks, replacing said

first group of said disks with a third group of said disks at an intermediate brake overhaul time when said available wear portions of said first group are substantially fully worn, said



available wear portions of each of said third group of said disks having a third thickness greater than the thickness of each of said available wear portions of said second group of said disks at said intermediate brake overhaul time.

4,613,018

BRAKING CALIPER FOR A SPOT-TYPE DISC BRAKE

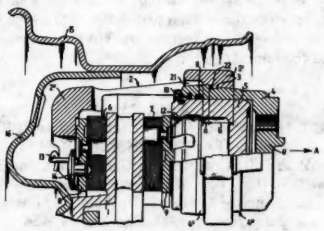
Rolf Weiler, Frankfurt - Sindlingen; Rudolf Thiel, Frankfurt am Main; Uwe Bach, Niedernhausen, and Peter Panek, Steinbach, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 16, 1984, Ser. No. 672,277

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341480

Int. Cl.[4] F16D *65/20;* **92** *170, 171;* **188** *72.4, 72.5, 368, 369, 370*

U.S. Cl. 188—72.4 **8 Claims**



1. A braking caliper for a disc brake comprising:

a brake caliper including a stepped bore having a small diameter portion and a large diameter portion defining an annular shoulder facing one of a pair of brake pad members of said disc brake, a generally pot-shaped rotationally symmetric wheel cylinder having a closed end and an open end including a first outer cylindrical surface portion having a diameter dimensioned to define a press fit with said small diameter portion of said stepped bore, a large diameter portion defining an external annular collar on said wheel cylinder, said wheel cylinder small diameter portion press-fitted into said small diameter portion of said stepped bore with said collar in abutment with said shoulder; and

a piston slidably, sealingly received in said wheel cylinder.

4,613,019

DISK BRAKE ASSEMBLY

Alberto Giorgetti, Paladina, Italy, assignor to Brembo S.p.A., Paladina, Italy

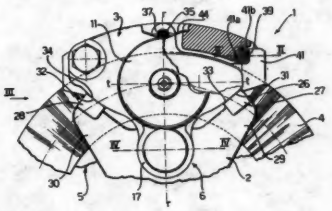
Filed Jan. 10, 1984, Ser. No. 569,766

Claims priority, application Italy, Jan. 10, 1983, 19048 A/83

Int. Cl.[4] F16D *55/00*

U.S. Cl. 188—73.31 **2 Claims**

1. Disc brake assembly of the type including a brake support, a caliper body for location astride a brake disc and provided with pads on opposite sides of the disc, said brake disc having an axis in a direction perpendicular to the disc and guide means (6) between the caliper body and brake support, extending in the direction of the axis of the disc, wherein the guide means (6) include a guide pin (16) on which the caliper body (3) is rotatably mounted, stop means (26) are provided on the support (2) for constraining angular movement of the caliper body, a pad mounting pin (35) is provided for loosely mounting the pads (9, 10) in the caliper body and wherein each said pad (9, 10) is provided with end hook portions (41) and two gudgeon pins (39, 40) are provided extending parallel to the guide



pin (16) on opposite sides thereof for cooperation with the respective hook portions of each pad for retaining the pads in the caliper body against drag from braking, said gudgeon pins (39, 40) comprising the shanks of respective bolts (42, 43) spanning the caliper body (3) and exerting a predetermined gripping force thereon whereby said bolts fulfill a dual function of exerting said force on said caliper body and cooperating by their gudgeon pin shank portions with said hook portions of said pads to retain said pads in said caliper body against drag from braking.

4,613,020

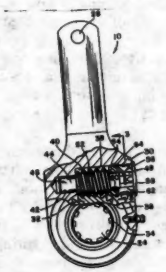
BRAKE SLACK ADJUSTER

Brian C. Deem, Avon Lake, Ohio, and William E. Ott, Rockford, Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 25, 1985, Ser. No. 727,308

Int. Cl.[4] F16D *65/46*

U.S. Cl. 180—196 M **11 Claims**



1. Brake slack adjuster comprising a housing, said housing defining a pair of intersecting bores therewithin, a gear rotatably mounted in one of said bores, a worm mounted on a worm shaft rotatable in the other bore and drivingly engaged with the gear, rotation effecting means on said worm shaft for effecting rotation of said worm from the exterior of said housing, a collar mounted on said worm shaft for rotatably supporting the latter in said other bore, and lock means cooperating with said collar and the wall of the other bore to prevent axial movement of the collar with respect to said other bore, said lock means including a resilient arm projecting radially into said bore and being deflectable radially with respect to said

other bore, said arm releasably engaging said worm shaft to inhibit rotation of the latter relative to said bore.

4,613,021

BRAKE DISC WITH REMOVABLE PADS

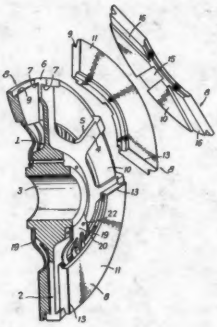
Alain Lacombe, Pessac, and Michel Vivés, Eysines, both of France, assignors to Société Européene de Propulsion, Puteaux, France

Filed Dec. 5, 1984, Ser. No. 678,233

Claims priority, application France, Dec. 21, 1983, 83 20496

Int. Cl.⁴ F16D *65/12*

U.S. Cl. 188—218 XL **5 Claims**



1. A disc brake disk comprising a core designed to withstand mechanical stresses, said core including a hub, a plurality of spokes surrounding said hub and hooks at the end of said spokes, each of said spokes having two opposite flat faces and two opposite edges, removable friction pads fitted on both sides of said core, each of said friction pads including a plurality of annular sectors, each sector having an axially outside friction surface and an axially inside mounting surface with lands and recesses, each sector having a radially outer edge with an oblique surface and a radially inner edge with an oblique surface, said hooks cooperating with the oblique surfaces of the outer edges of said sectors to form stops against both axial and radial movement of said sectors, said lands of said sectors on each side of said core bearing axially against one another back to back, each sector covering two angular spaces between spokes by overlapping one middle spoke and halves of two side spokes, said lands and recesses comprising a radial center slot having a bottom and edge walls and two radial half-width slots in the ends of the sector, said edge walls cooperating with said edges of said middle spoke for radial guidance and annular locking of the sector, a clearance being left between said bottom and said flat surface of said middle spoke, said half-width slots leaving room with clearance for said side spokes, the sectors on one side of the core being offset circumferentially relative to the sectors on the opposite side of the core by a half-sectors breadth and spring rings attached to the hub pushing elastically against corresponding oblique surfaces of the inner edges of the sectors so as removably to mount the sectors on the core.

4,613,022

TORQUE CONVERTER ONE WAY LOCK-UP CLUTCH

Sadanori Nishimura, Ohmiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

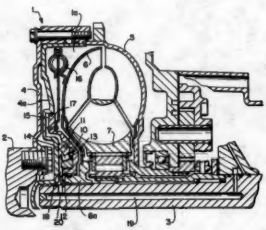
Filed Nov. 29, 1982, Ser. No. 444,879

Claims priority, application Japan, Nov. 28, 1981, 56-189910

Int. Cl.⁴ F16D *39/00*

U.S. Cl. 192—3.29 **5 Claims**

1. A fluid torque converter comprising; a drive plate connected to a driving power source an inner plate fixed to the drive plate, a pump wheel connected to the drive plate, a turbine shaft, a turbine wheel connected to the turbine shaft and positioned between the drive plate and the pump wheel, a one-way clutch positioned in a space defined by the drive plate and the turbine wheel and adapted to mechanically connect the drive plate and the turbine wheel, wherein the one-way clutch comprises a driving clutch member having a conical surface connected to the drive plate, a driven clutch member having a conical surface connected to the turbine wheel, a wedge roller means positioned between the conical surfaces of the driving



and driven clutch members, and means for moving the driving and driven clutch members relative to each other to mechanically connect the driving and driven clutch members via the wedge roller means, said means for moving the driving and driven clutch members relative to each other comprises an annular piston rotatably and axially slidable about the turbine shaft and fixed to the driven clutch member, a spring means provided between the annular piston and the turbine wheel and a hydraulic chamber formed in the space between the inner plate and the annular piston.

4,613,023

DEVICE FOR LIMITING OUTPUT FORCE APPLIED BY A ROTARY TRANSMISSION

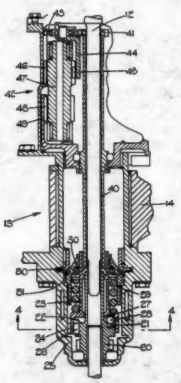
Terence W. F. Fairbairn, Welwyn Garden City, and Terence J. Capewell, Stafford, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 1, 1984, Ser. No. 667,428

Claims priority, application United Kingdom, Nov. 5, 1983, 8329617

Int. Cl.⁴ F16D *67/00, 7/00*

U.S. Cl. 192—8 R **6 Claims**



1. A device for limiting the force which can be applied by a rotary transmission, said device including an input shaft, a pivotally movable output member, first and second elements

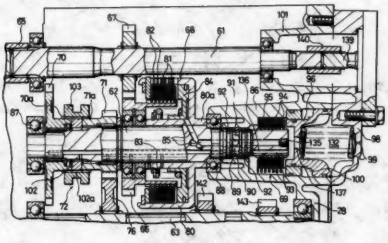
drivingly connected to said input shaft and said output member respectively, means, responsive to the torque between said first and second elements and to an axial load therebetween, for urging said elements to rotate in unison, a brake responsive to relative rotation between said elements, for arresting rotation of at least said second element, and means responsive to an operating position of said output member for varying said axial load, whereby application of said brake is dependent on said operating position and on the torque of said output member on said second element.

4,613,024

POWER TRANSMISSION FOR WORKING VEHICLES

Koji Irikura, Nishinomiya; Keisaku Hikishima, Kobe, and Koichiro Fujisaki, Ashiya, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Feb. 4, 1985, Ser. No. 698,140
Claims priority, application Japan, Feb. 24, 1984, 59-34737
Int. Cl.[4] F16D *67/04, 25/063, 55/40*
U.S. Cl. 192—18 A **7 Claims**



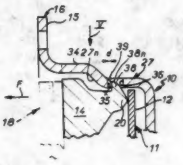
1. A power transmission for working vehicles wherein at least one fluid-operated clutch which selectively connects and disconnects a transmission path by selectively continuing and interrupting the input of power to a transmission shaft is mounted on said transmission shaft within a transmission case, said shaft being formed therein with a fluid path for supplying and draining clutch-operating fluid, and wherein a brake is provided to one end portion of said transmission shaft for braking the shaft in the non-operated state of said fluid-operated clutch, characterized in that a hollow cylinder which projects inwardly from an inner wall surface of said transmission case and encloses said one end portion of the transmission shaft is formed integrally with a wall of said transmission case, said one end portion of the transmission shaft having at the outer peripheral surface thereof an annular groove communicated to said fluid path and said annular groove being sealed by the inner peripheral surface of said hollow cylinder so as to form an annular fluid chamber between said shaft and said cylinder, that a fluid path for connecting said fluid-operated clutch to a control valve for controlling supply and drainage of clutch-operating fluid is formed in said hollow cylinder and is communicated to said annular fluid chamber so as to provide a rotary joint portion of a fluid conduit line for said fluid-operated clutch by said annular fluid chamber, and that a braking mechanism of said brake is arranged within said hollow cylinder by employing the cylinder as a brake case therefor, said wall of said transmission case including at an outer end of said hollow cylinder an opening through which assembly of said braking mechanism into said hollow cylinder is permitted from the outside of said transmission case, said opening being closed by a separate cover fixedly secured to said wall.

4,613,025

FRICTION CLUTCH MECHANISM WITH IMPROVED TRAVEL LIMITING DEVICE

Dominique Després, Clichy, France, assignor to Valeo, Paris, France

Filed Feb. 4, 1983, Ser. No. 463,832
Claims priority, application France, Feb. 4, 1982, 82 01809
Int. Cl.[4] F16D *13/44, 13/58, 13/71*
U.S. Cl. 192—70.18 **19 Claims**



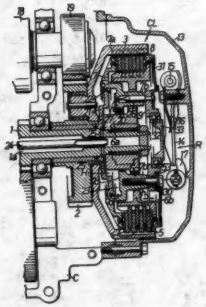
1. A clutch mechanism comprising a preassembled combination of components, said combination including an axially fixed part, an axially movable part, elastic means for axially biasing said axially movable part away from said axially fixed part towards a storage position, means for limiting the axial movement of said movable part in the storage position against the bias of said elastic means, said means for limiting the axial movement of said movable part comprising a retaining member on a first of said fixed part and said movable part and a transversely deflectable limiting member on a second of said fixed part and said movable part, said limiting member being transversely deflectable for clearing said retaining member during assembly of said combination of components and defining an axial abutment for determining the storage position for said movable part once said retaining member clears said limiting member.

4,613,026

FRICTION CLUTCH DEVICE

Kohei Ohzono, Fujimi, and Tsutomu Hayashi, Hoya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,989
Claims priority, application Japan, Jul. 2, 1982, 57-115257; May 14, 1983, 58-84813
Int. Cl.[4] F16D *13/42, 25/063*
U.S. Cl. 192—85 AA **7 Claims**



1. A friction clutch device having a plurality of alternating driving and driven friction plates, a hydraulic device for moving said friction plates in a preset direction to apply pressing force to said friction plates to engage said clutch, means for applying hydraulic pressure to said hydraulic device, spring means for applying pressing force to said friction plates in said

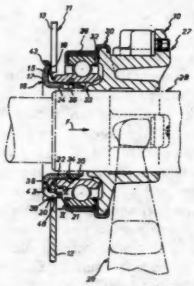
preset direction to engage said clutch, and a release device for releasing engagement of the clutch, said release device including means for mechanically releasing said pressing force of said spring means applied to said friction plates for releasing said clutch.

4,613,027

GRIPPING PIECE TO BE ATTACHED TO THE DIAPHRAGM OF A CLUTCH, AND AN ASSEMBLY UNIT CONSISTING OF SUCH A DIAPHRAGM AND SUCH A GRIPPING PIECE

Philippe Lassiaz, Boulogne, and Bernard Mallet, Wittelsheim, both of France, assignors to Valeo, Paris, France

Filed Apr. 10, 1984, Ser. No. 598,684
Claims priority, application France, Apr. 11, 1983, 83 05850
Int. Cl.⁴ F16D *13/50, 13/71*
U.S. Cl. 192—89 B **8 Claims**



1. A gripping piece for attaching a pull type clutch release bearing to radially inner ends of fingers of a clutch diaphragm spring, said gripping piece being of onepiece sheet metal construction and comprising means for coupling the pull type clutch release bearing thereto, a radial annular bearing collar having a bearing face cooperable with the radially inner ends of the diaphragm spring fingers for operating the diaphragm spring in traction at least two circumferentially spaced axially extending retaining lugs adapted to be received between adjacent pairs of radial fingers of the diaphragm spring, retaining fingers, at a free end of the respective retaining lugs, circumferentially extending in the same circumferential direction and in circumferential alignment with their associated retaining lugs, said retaining fingers defining retaining shoulders axially spaced from and on the opposite side of the diaphragm spring from said bearing collar, each of said retaining lugs having a single bend, the single bend extending circumferentailly and being located at a junction of said bearing collar and the associated retaining lug, and the gripping piece thus defines bayonet mounting means for attachment to the fingers of the diaphragm spring by temporary deflection of selected one of the adjacent pairs of diaphragm spring fingers.

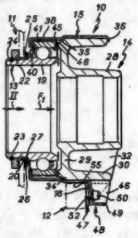
4,613,028

CLUTCH RELEASE BEARING SUITABLE FOR AUTOMOTIVE VEHICLE

Pierre Renaud, Le Plessis-Trevise, and Philippe Lassaiz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Sep. 22, 1983, Ser. No. 534,628
Claims priority, application France, Sep. 22, 1982, 82 15962
Int. Cl.⁴ F16D *23/00*
U.S. Cl. 192—98 **19 Claims**

1. A clutch release bearing for an automotive clutch comprising a drive member cooperable with a clutch release device, an operating member cooperable with a control member and operative in an axial direction for clutch release, a bush for axially coupling together said drive member and said operating member and being constrained to move with said operating member in said axial direction, at least one radial arm integral with said bush, at least one integral reinforcing rib on a rear side of said arm relative to said axial direction, and a protective member on a front side of said arm relative to



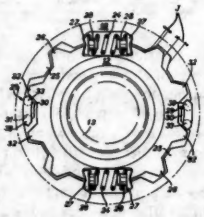
said axial direction engageable with the control member, said bush having two axially spaced circumferential shoulders of different diameters directed in the same axial direction, one of said shoulders engaging said operating member in the clutch release axial direction and the other of said shoulders engaging with said drive member in the clutch release axial direction.

4,613,029

TORSION DAMPING DEVICE FOR AN AUTOMOBILE CLUTCH FRICTION DISC

Carlo Beccaris, Santena, Italy, assignor to Valeo, Paris, France

Continuation of Ser. No. 324,942, Nov. 24, 1981, abandoned.
This application Aug. 9, 1984, Ser. No. 639,536
Claims priority, application France, Dec. 16, 1980, 80 26642
Int. Cl.⁴ F16D *3/14, 3/66, 3/68, 13/38*
U.S. Cl. 192—106.2 **6 Claims**



1. A torsion damping device for an automobile clutch friction disc, comprising two coaxial parts adapted for limited relative movement therebetween, first resilient means for opposing the relative movement between said two parts, one of said two parts comprising a web element and a hub coaxial therewith, complementary toothings, each comprising a plurality of teeth, being provided on said web element and on said hub, said web element and said hub being adapted for relative angular movement therebetween, which movement is limited to a sector of angular displacement defined by said complementary toothings, second resilient means for opposing the relative movement between said web element and said hub and third resilient means, comprising at least one block of elastomeric material interposed between the web element and the hub, said third resilient means being adapted to allow a positive circumferential striking action of the toothing of said web element against the toothing of said hub, but braking the relative movement between the complementary toothings to reduce noise caused by said striking action, said at least one block comprising a ring engaged around one of the teeth of one of the said toothings and disposed in a groove in that tooth, said

ring being adapted to be compressed by the neighbouring teeth of the other toothing.

4,613,030

FRICTION CLUTCH DRIVEN PLATE

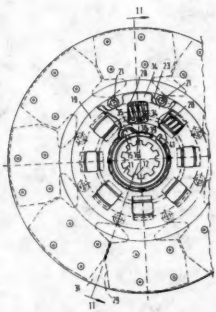
Ian C. Maycock; Robert J. Ball, both of Leamington Spa, and Denzil J. W. Symonds, Warwick, all of United Kingdom, assignors to Automotive Products plc, Leamington Spa, England

Filed Jun. 6, 1984, Ser. No. 617,709

Claims priority, application United Kingdom, Jun. 11, 1983, 8316095

Int. Cl.[4] F16D *13/68*

U.S. Cl. 192—106.2 8 Claims



1. A friction clutch driven plate comprising a hub and a friction facing carrier arranged co-axially with respect to each other; a central annular member comprising part of one of said hub and carrier and windows defined in said central annular member; a pair of further annular members secured together, spaced one to each side of the central member and forming part of the other of said hub and carrier and windows defined in said further annular members generally in register with said windows in the central member; main torsional vibration damping springing drivingly interconnecting the hub and carrier and comprising circumferentially directed compression springs arranged in said windows; a lost motion connection between the carrier and hub associated with said main torsional vibration damping springing; friction damping means effective between said central annular member and said pair of further annular members comprising a first annular friction member operatively arranged between a first member of said pair of further members and said central annular member and a second annular friction member and an axial biassing means operatively arranged between the second of said further annular members and said central member; and auxiliary torsional vibration damping springing operatively arranged in a driving connection between the hub and carrier wherein the auxiliary springing comprises two circumferentially extending spring arms one to each side of the central annular member, each positioned radially inward of one of said annular friction members and arranged to be loaded in bending with relative movement between the hub and the carrier during lost motion connection of the main springing.

4,613,031

DEVICE FOR SORTING FISH

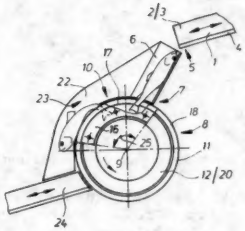
Werner Wenzel, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Machinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 651,212

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333740

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—399 20 Claims



1. A device for sorting into uniform head-tail alignment, a plurality of fish each having a relatively thick, blunt head, a relatively thin tail and a body extending along a longitudinal axis defined therebetween, with said fish being delivered to said device along their longitudinal axes in a random head-leading and tail-leading orientation, and with said device being adapted to sort said fish into uniform head-tail alignment by turning any of said fish as are led thereto with tail leading to a head-leading position, said device comprising:

a supplying channel for receiving individually each of said fish led to said device,

driven clamping and turning means for seizing the tail region of such fish as are received in the supplying channel in tail-leading position, and for turning such fish into head-leading position,

outlet means for delivering said fish from said device,

said supplying channel communicating with said clamping and turning means at a first junction position, and said outlet means communicating with said clamping and turning means at a second junction position,

said clamping and turning means comprising a clamping unit having a defined diameter, and defining a gripping gap, wherein said clamping unit includes a disc having a frontal surface provided with skid resisting properties over at least part thereof and driven to rotate about a substantially horizontal axis in a defined direction of rotation, and a gripping surface fixedly opposed to said frontal surface to form said gripping gap therebetween said gripping surface being substantially parallel to said frontal surface and being positioned between said first junction position and second junction position at least in the region above said axis of said disc means said gripping gap having a width greater than the thickness of said fish tail and less than the thickness of said fish head.

4,613,032

APPARATUS FOR PLACING PALLETS ON A LOADING SURFACE

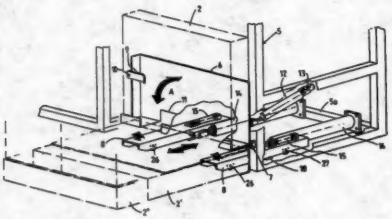
Maurice Berger, and Jean-Francois Bernasconi, both of Cortaillod, Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Continuation of Ser. No. 530,189, Sep. 8, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 750,232

Claims priority, application European Pat. Off., Jul. 6, 1983, 83810308.3

Int. Cl.[4] B65G *57/24*

U.S. Cl. 198—409 8 Claims



1. Apparatus for placing pallets on a loading surface, said apparatus comprising:

a receiver above said surface capable of pivoting about a horizontal axis above said surface between a receiving position and a folded-back position, and in the receiving position capable of supporting a pallet placed on its edge, said receiver having a retaining means thereon for retaining said pallet on said receiver during said pivoting and for maintaining said pallet on said receiver in a withdrawal position when said receiver is in said folded-back position;

a mobile conveyer having pushing means for engaging with a pallet positioned in the withdrawal position;

drive means for displacing said pushing means in a horizontal direction perpendicular to said axis, thus imparting to said pallet a positioning displacement on said loading surface between the withdrawal position and a loading position and releasing the pallet from the receiver during the course of said displacement; and

control means for detecting a predetermined length of said positioning displacement, and for stopping said drive means after having detected said length, whereby said drive means places said pallet in a precisely determined loading position on said loading surface.

4,613,033

APPARATUS FOR THE INTRODUCTION OF OBJECTS, ESPECIALLY PACKETS, INTO A PACKET TOWER

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co), Verden, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,494

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333884

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—457 10 Claims

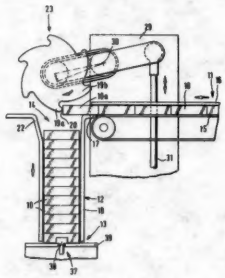
1. A device for diverting packages from a first conveyor into the top open end of a second conveyor, arranged perpendicular to said first conveyor, the packages being removed from the lower end of the second conveyor, comprising:

(a) in the area between said first conveyor (**11**) and the top open end (**14**) of said second conveyor (**12**), a plurality of movable abutments (**19***a*, **19***b* . . .) arranged to move in the movement direction of said packages while conveyed by said first conveyor, when said abutments contact the front end face (**20**) of said packages,

(b) said movable abutments (**19***a*, **19***b* . . .) being arranged along the circumference of a rotating abutment disc (**23**),

(c) means for reversibly moving the abutment disc (**23**) toward and away from said second conveyor to allow insertion of the packages (**10***a*) into the top open end of said second conveyor (**12**),

(d) in the area of the top open end (**14**) of said second conveyor (**12**) flexible holding jaws (**34**, **35**) for temporarily holding each package (**10***a*) in a friction-tight manner in the plane of the first conveyor (**11**) until insertion into said second conveyor (**12**), and



(e) means to rotate said abutment disc.

4,613,034

APPARATUS FOR CONVEYING CORRUGATED MEMBERS

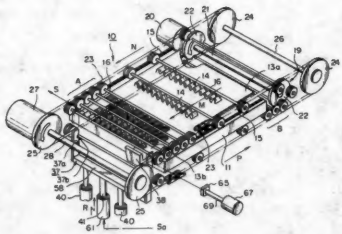
Yasuo Hibi, Ohbu; Tadahiko Shibata, Aichi, and Takatoshi Iwase, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 9, 1985, Ser. No. 753,621

Claims priority, application Japan, Jul. 10, 1984, 59-141374

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—465.1 10 Claims



1. An apparatus for conveying corrugated members comprising;

a guide plate which has a receiving end for receiving the corrugated members and a discharging end for discharging the corrugated members which are conveyed on the guide plate from the receiving end to the discharging end;

a pair of guide rails which are located at the lateral opposite sides of the guide plate and which extend in parallel with the guide plate;

a number of conveyance bars which extend in a direction perpendicular to the conveyance direction of the corrugated members and which are provided, on their opposite ends, with rotatable rolling wheels which can roll on the associated guide rails and with flanges which are adapted to provide a predetermined space between the adjacent conveyance bars when the adjacent flanges of the adjacent conveyance bars come into contact with each other,

a bar feeding device for feeding the conveyance bars onto the receiving end of the guide plate one by one to put the

rolling wheels of the conveyance bars on the corresponding guide rails;

means provided on the lateral sides of the guide plate for causing the rolling wheels to continuously rotate on the guide rails in order to roll the rolling wheels on the guide rails, thereby to move the conveyance bars along the guide plate in the direction perpendicular to the length of the corrugated members, resulting in the movement of the corrugated members by the associated conveyance bars in the same direction;

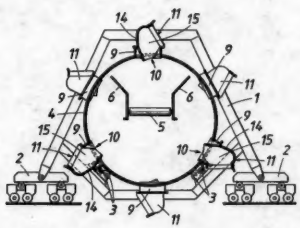
a bar receiving device provided at the discharging end of the guide plate for receiving the frontmost conveyance bars to bring the same beneath the guide plate; and

means for returning the conveyance bars brought beneath the guide plate to the bar feeding device.

4,613,035
APPARATUS FOR REMOVING BULK MATERIAL FROM A DUMP

Klaus Eisenkolb, Linz; Franz Plochberger, Leonding, and Johann Pühringer, Ottensheim, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 9, 1985, Ser. No. 753,236
Claims priority, application Austria, Jul. 25, 1984, 2399/84
Int. Cl.[4] B65G *65/16, 17/36*
U.S. Cl. 198—509 **5 Claims**



1. In apparatus for removing bulk material from a dump, comprising

a frame,

a scooping tube having a horizontal axis and mounted in said frame for rotation about said axis and being formed with a plurality of entrance openings spaced apart in the peripheral and axial directions of said tube,

drive means for rotating said tube about said axis,

a plurality of buckets mounted on said tube and protruding out of said tube and into said tube through respective ones of said entrance openings and adapted to scoop material from said dump and to drop material from the apex of said tube into said tube during the rotation of said tube about said axis,

a conveyor extending in said tube along the same and adapted to receive bulk material which has been dropped from said buckets into said tube,

each of said buckets having a leading edge adapted to enter said dump during a rotation of said tube in a predetermined sense, and a back extending from said leading edge toward said tube and adapted to guide material in said bucket from said leading edge toward said tube,

the improvement residing in that

an annular collar is mounted on said tube at each of said entrance openings and protrudes radially outwardly from said tube,

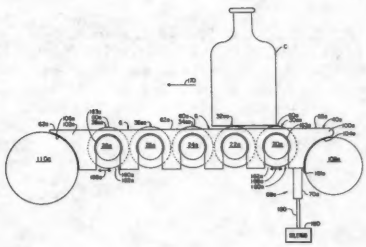
each of said buckets is secured to one of said annular collars and

said back of each of said buckets extends through one of said collars and through one of said entrance openings and protrudes radially outwardly and radially inwardly from said collar.

4,613,036
ROLLER CONVEYOR WITH IMPROVED COMB STRUCTURE

Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154

Continuation-in-part of Ser. No. 600,536, Apr. 16, 1984. This application Apr. 8, 1985, Ser. No. 720,708
Int. Cl.[4] B65G *47/74*
U.S. Cl. 198—633 **12 Claims**



1. A stabilized roller conveyor comprising:

a plurality of spaced generally parallel roller rods;

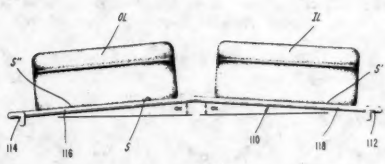
a number of rollers mounted on each of said rods and defining an upper surface for engaging conveyed objects; and

a comb structure including a plurality of comb elements extending longitudinally along the conveyor transverse to said rods, one said comb element being disposed between each pair of adjacent rollers on each of at least two successive rods, each element having a plurality of recesses disposed in a lower longitudinal edge thereof for receiving a plurality of successive rods and a substantially level upper longitudinal edge extending upwardly above said rods and beneath the upper surface defined by said rollers; and further including means for selectively raising said comb element to at least the level of the upper surface defined by said rollers to brake items conveyed thereon.

4,613,037
ROD-TYPE CONVEYOR BELT

David B. Park, Spring Grove; John A. Weaver, York, and A. Scott Zumbrum, Jacobus, all of Pa., assignors to Stewart Systems, Inc., Plano, Tex.

Continuation of Ser. No. 465,446, Feb. 10, 1983, abandoned. This application Jul. 9, 1985, Ser. No. 754,183
Int. Cl.[4] B65G *21/18*
U.S. Cl. 198—778 **5 Claims**



1. A longitudinally elongate conveyor belt for conveying a plurality of items at least some of which are transversely spaced, said belt comprising a plurality of interconnected, generally transversely extending rod members which are spaced apart along the longitudinal direction to define air circulation spaces therebetween, link means at the ends of said rods each being looped around an adjacent rod to interconnect the rods, said rod members each being upwardly arched intermediate its ends to define a first transverse item-supporting segment for supporting first items and a second transverse

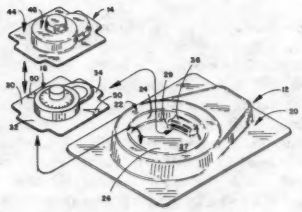
item-supporting segment for supporting second items in transversely spaced relation to said first items, said first and second segements diverging in the downward direction so as to resist a tendency for the first and second items to be displaced against one another, said rods being arched to an extent which only partially compensates for the weight of said first and second items whereby said rods remain arched with said first and second items seated thereon.

4,613,038

METHOD AND APPARATUS FOR MODULAR PACKAGING OF BICYCLE CABLES AND LOCKS

Randy W. Kirk, Culver City, Calif., assignor to American Cycle Industries, Inc., Buena Park, Calif.

Filed Oct. 4, 1985, Ser. No. 784,786
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—216 **15 Claims**



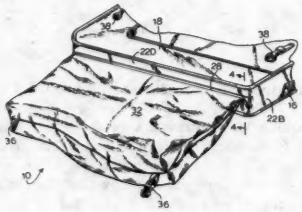
1. Modular packaging apparatus for selectively assembling together in different combinations sets of modular bicycle cable packages and bicycle lock packages, each set including a single bicycle cable and a single bicycle lock, comprising interchangeable bicycle cable packages each including a bubble pack covering a coiled cable beneath a bubble having an annular interior wall defining a plurality of spaced, coplanar slots therein and defining a cavity therewithin, and interchangeable bicycle lock packages each including a stiff backing having divergent coplanar tabs adapted for insertion into corresponding ones of said slots.

4,613,039

DROP BOTTOM GARMENT BAG

Anthony Shaw, Chappaqua, N.Y., and Jesse Zuckerbrod, Hillsdale, N.J., assignors to D. Klein & Son, Inc., Lodi, N.J.

Filed Mar. 11, 1985, Ser. No. 710,584
Int. Cl.[4] A45C *7/00*; B65D *85/18*
U.S. Cl. 206—287.1 **6 Claims**



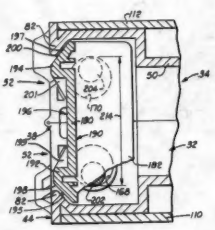
1. A garment bag comprising:
a garment receiving compartment defined by front and rear panels interconnected by respective side, top and bottom panels;
a closable opening in said front panel to permit access to said compartment;
a slit in said bottom panel forming a bottom opening in said compartment;
closing means for selectively closing said bottom opening;
a pocket having edges connected to the edges defining said bottom opening slit and movable between a first position in which said pocket is received within said compartment, and a second position in which said pocket extends outwardly from said bottom opening to increase the effective length of said garment receiving compartment;
attaching means on the bottom of said pocket and on the outer surface of said front panel for connecting said pocket to said front panel in a folded upward condition when said pocket is in said second position;
said garment bag being adapted to be folded along a fold line with one portion of said front panel superposed on the other portion to sandwich said extended pocket therebetween to protect said pocket from damage.

4,613,040

FOLDING CASE

Robert L. Morris, II, Manchester Center, Vt., and Franklin C. Nichols, Dallas, Tex., assignors to Pente Games, Inc., Stillwater, Okla.

Filed Apr. 4, 1984, Ser. No. 596,834
Int. Cl.[4] B65D *6/00, 43/14*
U.S. Cl. 206—315.1 **20 Claims**



1. A case, comprising:
a first case section and a second case section, each case section comprising:
a floor panel having an upper side and an under side; and
a wall attahced to the floor panel and extending partially thereabout to leave a gap through the wall at a rear side of the case section, said wall having an upper edge disposed a distance above the upper side of the floor panel;
said case sections including hinge means hingedly connecting the rear sides of the case sections at the upper edges of the walls and at the ends of the gaps through the walls for relative pivotation of the case sections to an open position of the case wherein the gap in the wall of the first case section is aligned with the gap in the wall of the second case section and the floor panels are adjoined in a substantially coplanar relation and for relative pivotation of the case sections to a closed position of the case wherein said floor panels are disposed in a spaced apart, facing relation said hinge means including at least one hinge element attached to each case section, at least a pair of hinge elements hinged together at a common point for pivoting throughout movement of the case sections from opened to closed, each of said hinge elements having an opposite end relative to said point of pivotation said opposite ends come into close proximity when said case is in the open position;
a closure panel comprising a laminar central portion; and
mounting means, for mounting the closure panel on the section, for positioning the central portion of the closure

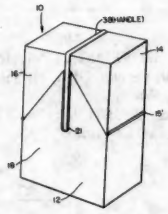
panel in an overlaying, generally parallel relation to adjacent portions of the floor panels in the open position of the case and for positioning the central portion of the closure panel across the gaps in the walls in the closed position of the case.

4,613,041

PORTABLE STORAGE KIT FOR HOUSEHOLD CLEANSERS

Robert E. Carlton, Rte. 2, Hwy. 58, Boydton, Va. 23917

Filed Jun. 18, 1985, Ser. No. 746,104
Int. Cl.[4] B65D *85/28*
U.S. Cl. 206—373 **7 Claims**



1. A portable storage kit for carrying household cleaners and other cleaning implements comprising:

a main carrying section comprising a rectangular base and four side walls, said side walls comprising a pair of opposing substantially rectangular walls and a pair of opposing walls of substantially pentagonal shape; said main carrying section further comprising a partition means, located between and extending substantially parallel to said opposing rectangular walls, for dividing said main carrying section into two compartments each capable of retaining household cleaners and other cleaning implements, and a generally U-shaped handle, one end of said handle being attached to one of said pentagonal walls and the other end of said handle being attached to the other of said pentagonal walls; and

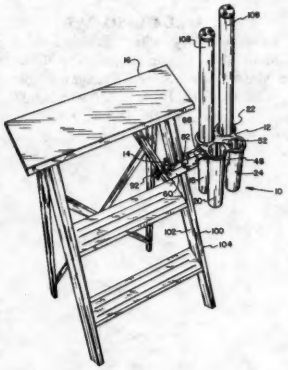
first and second side carrying sections each comprising a rectangular base and four side walls, said side walls of said side carrying sections comprising a pair of opposing walls of substantially trapezoidal shape and a pair of opposing rectangular walls and defining with the base of the corresponding carrying section a compartment capable of retaining household cleansers and other cleaning implements, means for hingedly connecting each of said side carrying section to said main carrying section such that the side sections can be moved between a first, open position wherein the side sections are positioned on opposite sides of the main section and the compartments defined by the side sections are exposed and the base of each side carrying section lies substantially flush with the base of the main carrying section, and a second, closed position wherein in the side sections are positioned on top of the main container and form therewith a generally rectangular enclosure, said connecting means each comprising a hinged joint located between the upper edge of one of the rectangular walls of said main carrying section and the upper edge of the rectangular wall of the corresponding side carrying section adjacent to that rectangular wall, said side carrying sections being of the same size and this size being such that when the side carrying sections are moved to the second, closed position thereof, one of the rectangular walls of each said side carrying section is disposed adjacent to said handle on each side thereof, and the base and trapezoidal side walls of each of said side carrying sections lie substantially flush with said handle so that the handle is not exposed for gripping by user, said kit further comprising means for mounting said handle on said main carrying section so as to prevent movement of the handle in the direction which the sides of the U-shaped handle extend.

4,613,042

LAMP HOLDER

Walter H. Aeschliman, Bluffton, Ind., assignor to Kar-Glo Industries, Inc., Bluffton, Ind.

Filed Apr. 25, 1985, Ser. No. 727,281
Int. Cl.[4] B65D *85/42*
U.S. Cl. 206—419 **5 Claims**



1. A fluorescent lamp holder comprising:

a first rigid tubular compartment and a second rigid tubular compartment, said tubular compartments having open top ends and closed off bottom ends and having sufficient length and width to support therein upon said closed off bottom ends of elongate fluorescent lamps, said tubular compartments being connected together substantially parallel to one another with the bottom ends being vertically offset so that upper ends of lamps of the same length received in the compartments will be vertically offset thereby enabling easy grasping and viewing of the upper ends of the lamps, and a plurality of longitudinal reinforcing ribs on a side wall of each of said tubular compartments,

a resilient cushion within each of said tubular compartments located on the bottom ends thereof adapted for cushioning the ends of lamps supported in the compartments to prevent breakage and damage to the contact pins of the lamps when the lamps are inserted; and

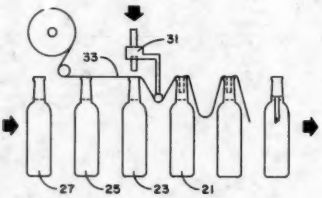
clamp means detachably connected to said tubular compartments for rigidly clamping said tubular compartments to a support structure and for supporting said compartments in a substantially vertical position wherein said tubular compartments are connected to said clamp means by a cantilever support element having a reinforcing flange thereon.

4,613,043

BOTTLE CLOSURE

Philip L. Reid, Rte. 2, Box 422, Duncan, S.C. 29334, and Edward L. Holcombe, 21 Rowley St., Greenville, S.C. 29601

Filed Apr. 8, 1985, Ser. No. 720,854
Int. Cl.[4] B65D *39/16*
U.S. Cl. 206—428 **3 Claims**



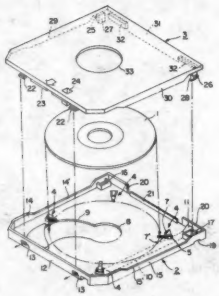
3. A plurality of corked bottles each connected to another of said bottles by a ribbon extending from beneath each cork within each bottle to another of said corks within another of said bottles.

4,613,044

COMPACT DISC CASE

Ikuo Saito, Kamakura; Ryosuke Minakata, Yao, and Yukio Suzuki, Hatano, all of Japan, assignors to Nikkodo Co., Ltd., Osaka and Marantz Japan Inc., Kanagawa, both of, Japan

Filed Dec. 21, 1984, Ser. No. 684,607
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—444 **6 Claims**



1. A compact disc case comprising a lower case and an upper case, the lower case and the upper case being fixed together with a space therebetween so that a compact disc can be rotatably placed in the space, wherein:

the lower case comprises:

a through hole provided at the center;

engagement holes formed on the front wall of the lower case;

latch locks provided at the rear ends of the side walls of the lower case; and

at least three cushion holders provided on the bottom of the lower case, the holders being around a position where the compact disc is placed, and each one of the cushion holders comprising a holding piece and a cushion pad:

the holding piece being formed to stand on the bottom of the lower case; and

the cushion pad, provided with a support pad and substantially the same height as the space between the upper case and the lower case, being mounted on the holding piece so that the top surface of the pad is above the upper edge level of the lower case and the support pad located inside the disc placement position,

the upper case comprises:

an opening formed at the center;

engagement pawls formed on the front edge of the upper case, the engagement pawls engaging with the engagement holes of the lower case; and

latches formed at the rear ends of both sides of the upper case, the latches being snapped to engage with the latch locks of the lower case; and

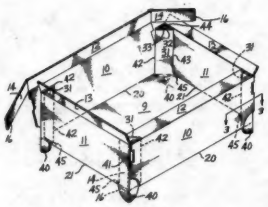
a guide means provided in at least one of the upper and lower cases for preventing erroneous placement of the compact disc case in a disc player.

4,613,045

BULK SHIPPING CONTAINER

Robert L. Watson, Mt. Vernon, Ohio, assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 29, 1985, Ser. No. 770,826
Int. Cl.[4] B65D *5/22*
U.S. Cl. 206—512 **4 Claims**



1. A blank for a shipping container comprising;

a base,

a pair of opposing end walls foldably joined to said base,

a top end panel foldably joined to each of said end walls,

two post extensions joined by folds to each of said end walls,

two proximal corner reinforcements foldably joined to each of said post extensions,

two middle corner reinforcements foldably joined to each of said proximal corner reinforcements wherein each said middle corner reinforcement contain an interlock extension,

two distal corner reinforcements foldably joined to each of said middle corner reinforcements,

two corner posts foldably joined to and extending from each of said end walls and said post extensions wherein said folds between said post extension and said end wall extend linearly through said corner posts,

a pair of opposing side walls foldably joined to said base,

a top side panel foldably joined to each of said side walls,

two flaps foldably joined to each of said top side panels wherein each said flap contains an interlock extension, and

four apertures situated between said base and said end walls and adjacent to said corner posts.

4,613,046

RECLOSABLE PACKAGE AND CARTON BLANK

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River Corporation, Richmond, Va.

Filed Jun. 28, 1984, Ser. No. 625,725
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—622 **18 Claims**

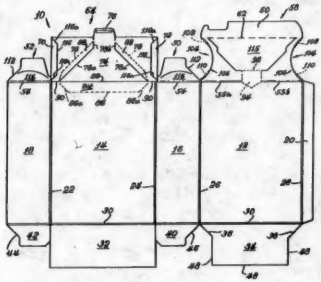
1. A carton blank for a reclosable carton, having end closure flaps, made from carton stock coated, at least on the end closing flaps thereof, with a heat-sealing coating, which comprises:

a front panel, a rear panel, and side panels adapted to be

sealed together to form a carton tube, and end closure flaps therefor comprised of dust flaps, a cover flap and a sealing flap which flaps can be folded in, in the order named, to form an end closure; p1 said dust flaps having narrow, heat-sealable areas adjacent and along the dust flap-side panel fold lines from one end to the other end thereof;

said cover flap having portions along the end edges thereof cut away complementary with the heat-sealable areas of said dust flaps and a heat-sealable area along and adjacent the cover flap-rear panel fold line from one end of said cover flap to the other end thereof and which, in the erected carton, forms with said dust-flap heat-sealable areas, a continuous, planar, generally U-shaped sealing zone along and adjacent to the cover flap-rear panel fold line and the dust flap-side panel fold lines;

said continuous, planar, generally U-shaped sealing zone, in the end closure in the erected carton, lying in juxtaposition with a correspondingly planar, generally U-shaped



sealing zone of said sealing flap with the juxtaposed portions of said cover flap and said sealing flap lying within said generally U-shaped sealing zones being unsealable and said end closure flaps being thus heat-sealable by means of said juxtaposed, continuous, planar, generally U-shaped sealing zones into a unitary end closure;

said sealing flap having a portion separable therefrom by ply-separation means coincident with the inner edges of said generally U-shaped sealing zones whereby, when said end closure is made, the unsealed portion of said sealing flap can be stripped away from the unsealed portion of said cover flap, and wherein said cover flap has tear means which, when said end closure is made, facilitates opening thereof and provides a cover that can be opened and reclosed;

said end closure being formed into a carton without the addition of adhesive or other material; and said cover flap being free of openings therein or opening-forming tear-outs therein.

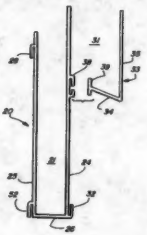
4,613,047

SMALL ARTICLE DISPLAY ASSEMBLY

Jess C. Bushyhead, Kansas City; Harvey L. Kolster, Grain Valley; Michael G. Lowry, Holt, all of Mo., and Fred C. Wolf, Overland Park, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed Mar. 25, 1985, Ser. No. 715,531
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—55 **8 Claims**

1. A display unit for displaying and storing articles comprising a horizontally extending, generally U-shaped storage compartment defined by spaced, vertically extending rear and front walls joined by a horizontal bottom wall, the vertical extent of said front wall being at least as great as that of said rear wall, and a horizontally extending generally U-shaped display compartment being defined by a vertically extending forward wall, a bottom wall and the front wall of the storage compartment, the said display compartment being fixedly attached to the upper portion of the vertically extending front wall of said storage compartment, the vertical extent of said display compartment being substantially less than that of said storage compartment, whereby articles stored in said storage compartment



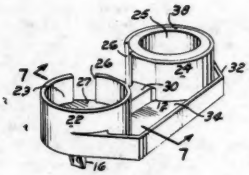
are concealed from frontal view when articles are displayed in said display compartment, both the storage and display compartments being adapted to receive articles to be displayed and the front and rear walls of said storage compartment having on the exterior surfaces thereof U-shaped and inverted U-shaped, respectively, flange members whereby one display unit can be joined to another display unit.

4,613,048

AUTOMOTIVE CONSOLE BEVERAGE CONTAINER SUPPORT

Dennis E. McGill, P.O. Box 178, Sulphur, Okla. 73086

Filed May 13, 1985, Ser. No. 733,021
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—71 **2 Claims**



1. A beverage container support, comprising:

an elongated horizontal planar base panel adapted for extending transversely across and flatly contacting an automobile console overlying the automobile drive shaft between the front passenger and drive seats,

said base panel having generally circular upstanding portions at its respective ends at least equal in thickness to twice the thickness of the remaining portion of the base panel and having a reinforcing lug substantially square in transverse section and substantially of equal thickness with said thickened portions extending between and interconnecting the latter;

means including a leg normal to and rigidly depending from respective end portions of said base panel on opposite sides of the console for securing the base panel to the console;

an upstanding generally circular cup receiving wall on the respective thickened portion forming beverage container support wells at respective end portions of said base panel, said walls each having a vertical slot for loosely nesting the handle of a cup when disposed within the respective well; and,

an elongated upstanding wall substantially equal in height

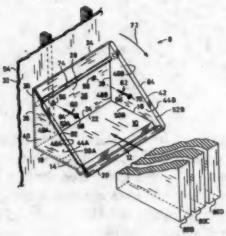
with the thickness of the lug connected with the respective well forming wall and extending along the forwardly disposed edge of said base panel for forming a coin and small article receiving receptacle.

4,613,049

UNITARY WALL-MOUNTED SHELF

James H. Walker, 417 Welshwood Dr., Nashville, Tenn. 37211

Filed May 13, 1983, Ser. No. 494,265
Int. Cl.[4] A47F 5/08; A47G 29/02
U.S. Cl. 211—88 **4 Claims**



1. A molded unitary shelf device for mounting to a vertical mounting surface with at least two fastening means passing therethrough into such mounting surface, such shelf device reducing tension and shear forces applied to such fastening means by weight applied to such shelf device, which comprises:

a substantially rectangular rear wall having a planar rear surface for being positioned against such mounting surface, said rear wall having top and bottom edges and first and second end edges, said rear wall being provided with an integral reinforcing rib parallel to and spaced from said top edge and extending proximate said end edges, and further provided with at least two apertures proximate said reinforcing rib to receive such fastening means;

a substantially rectangular shelf element integrally molded with said rear wall, said shelf element having a rear edge joined to said bottom edge of said rear wall, a front edge and first and second end edges, said front edge formed with a strengthening lip, said shelf element being substantially perpendicular to said rear wall;

a first substantially triangular end wall integerally molded with said rear wall and said shelf element, said first end wall having first, second and hypotenuse edges, said first edge being coextensive with and integrally joined to said first edge of said rear wall, said second edge being coextensive with and integrally joined to said first edge of said shelf element;

a second substantially triangular end wall integrally molded with said rear wall and said shelf element, said second end wall having first, second and hypotenuse edges, said first edge being coextensive with and integrally joined to said second edge of said rear wall, said second edge being coextensive with and integrally joined to said second edge of said shelf element;

a reinforcing lip integrally formed along each of said hypotenuse edges of said first and second triangular end walls, said lip being oppositely directed; and said device being of substantially uniform thickness; and

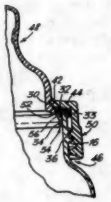
whereby said unitary structure produced by said rear wall, said shelf element and said triangular end walls substantially reduces tension and shear forces applied to such fastening means when such shelf/sink device is fastened to such mounting surface and weight is applied to said shelf element.

4,613,050

BABY FEED BOTTLES

Edward Atkin, 4 Redington Road, London, NW3, and Roger L. Williams, 5 Tudor Rise, Broxbourne, Hertfordshire, EN10 7HB, both of England

Filed Sep. 27, 1984, Ser. No. 654,726
Claims priority, application United Kingdom, Feb. 1, 1984, 8402664
Int. Cl.[4] A61J 9/00
U.S. Cl. 215—11 B **9 Claims**



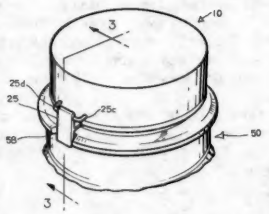
1. A teat for a baby feed bottle, said teat having a mouthpiece with a perforated end surface, a portion widening towards the other open end of the teat which fits to the feed bottle, an external annular flange at said open end, with at least one groove adapted to permit the passage of air from the exterior to the interior of a baby feed bottle when fitted to the rim of the neck thereof, a lip depending from the flange inwardly of the outer periphery of the latter, and an external groove in the wall of the teat, said groove being located at a small axial spacing from the annular flange towards the mouthpiece and radially inwardly of the lip.

4,613,051

CHILD-RESISTANT PACKAGE

Peter T. Swartzbaugh, 3946 Londonderry La., Toledo, Ohio 43615

Filed Aug. 12, 1985, Ser. No. 764,356
Int. Cl.[4] B65D 55/02
U.S. Cl. 215—225 **12 Claims**



1. A child-resistant package comprising, in combination:

a container having a central axis and comprising an open mouth and a finish surrounding said open mouth, said finish of said container comprising:

a first annular bead projecting radially outwardly from said finish, said first annular bead being discontinued to define a notch in said first annular bead between the discontinued portions thereof;

second annular bead means projecting radially outwardly from said finish, said second annular bead means being spaced from said first annular bead along said central axis of said container; and

a flange projecting radially outwardly from said finish, the radial extent of said flange being greater than the radial extent of said first annular bead and the radial extent of

said second annular bead means, said flange being spaced along said central axis of said container further from said open mouth of said finish than said first annular bead and said second annular bead means and having at least a peripheral portion which is discontinued to define a notch in said flange between the discontinued portions thereof, said notch in said flange being circumferentially offset with respect to said notch in said first annular bead; and

a closure surrounding and removably engaging said finish and closing said open mouth of said container, said closure comprising:

a top panel spanning said open mouth of said container;

a skirt affixed to said top panel and extending therefrom generally parallel to said central axis of said container to surround said first annular bead of said finish;

a tab affixed to said skirt and extending radially inwardly therefrom, said tab being spaced along said central axis further from said open mouth of said finish than said first annular bead, the circumferential extent of said tab being less than the circumferential extent of said notch in said first annular bead, said tab having a tip that extends radially inwardly to underlie said first annular bead when said top is not aligned with said notch in said first annular bead, whereby an interference relationship exists between said tip and said first annular bead when said tab is not aligned with said notch in said first annular bead; and

a resilient projection affixed to said skirt and extending radially outwardly and downwardly therefrom, the circumferential extent of said resilient projection being less than the circumferential extent of said notch in said flange, said resilient projection extending axially downwardly to a position which is spaced further along said central axis from said open mouth of said finish than said flange, said resilient projection clearing said finish when circumferentially aligned with said notch in said flange and being normally disposed radially inwardly of the outside of said flange to inhibit the turning of said closure on said finish when said resilient projection is circumferentially aligned with said notch in said flange, said resilient projection being elastically deformable to a position which does not inhibit the turning of said closure on said finish, said resilient projection not being circumferentially aligned with said notch in said flange when said tab is circumferentially aligned with said notch in said first annular bead, whereby it is necessary to deform said resilient projection and then turn said closure relative to said finish to bring said tab into circumferential alignment with said notch in said first annular bead before said closure can be manually removed from said finish.

4,613,052

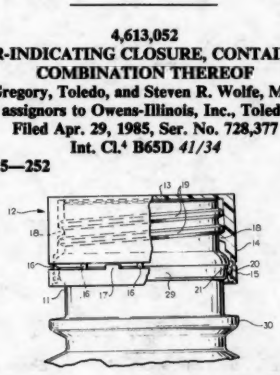
TAMPER-INDICATING CLOSURE, CONTAINER AND COMBINATION THEREOF

James L. Gregory, Toledo, and Steven R. Wolfe, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 29, 1985, Ser. No. 728,377

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 **7 Claims**



1. A screw cap for closing the open upper finish of a container comprising, a generally disc-shaped top with an integral, cylindrical, depending skirt, a generally cylindrical flexible, indicating band attached to the annular bottom of said skirt by a plurality of circumferentially spaced, frangible bridging members, a full annular stop ring formed integrally with the indicating band and attached to the interior thereof, said stop ring being positioned inwardly and upwardly with respect to the interior of said indicator band, the upper edge of said stop ring being of sufficient thickness to span any spaced between a container finish to which the closure is applied and the indicating band when in undisturbed, sealing position on the container, and said stop ring adapted to engage beneath an element of the container and prevent the ring from passing the container element after assembly of the closure on a container.

4,613,053

SOLID AND LIQUID GOODS TRANSPORTING CONTAINER

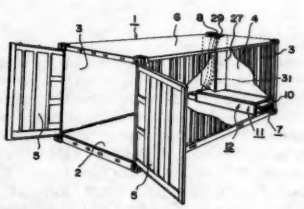
Tetsuro Kimura, and Kohei Ide, both of Yokohama, Japan, assignors to Tokyu Sharyo Seizo Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 13, 1985, Ser. No. 765,367

Claims priority, application Japan, Aug. 14, 1984, 59-124098[U]

Int. Cl.[4] B65D *1/24, 1/36, 57/00*

U.S. Cl. 220—22 **8 Claims**



1. A solid and liquid goods transporting container characterized in that a liquid containing bag is mounted on the upper surface of the floor of a box-shaped container and is provided with an inlet port and outlet port opening outside the container and a protective partition forming a space for housing the above mentioned liquid containing bag when solid goods are to be transported is provided in the lower corner on the front end panel side of the container.

4,613,054

FILLER BODY FOR RECEPTACLES FOR COMBUSTIBLE FLUIDS AND METHOD OF MAKING SAME

Hannes Schrenk, Schneeberggasse 10, A-2700 Wiener Neustadt, Austria

Filed Sep. 20, 1985, Ser. No. 779,088

Claims priority, application Austria, Sep. 20, 1984, 2990/84

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—88 R **12 Claims**

1. A filler body for introduction into a receptacle for a

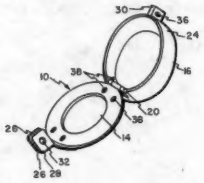
combustible liquid or gas, especially gasoline for hindering explosion-like combustion, comprising a ball having substantially a smooth outer surface and a large-pore internal structure composed of expanded metal.

4,613,055

FUEL TANK CAP COVER

Arthur F. Connors, 2496 Baltusrol Ct., Union City, Calif. 94587

Filed Jun. 25, 1985, Ser. No. 748,690
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—210 **12 Claims**



1. A cap cover adapted to be fitted freely over a neck of upper portion of a fuel tank filler pipe of a truck to prevent unauthorized withdrawal of fuel from said tank, comprising:

a one-piece base ring including a large central aperture therein, said central aperture having a diameter larger than the exterior diameter of said filler pipe and smaller than the exterior diameter of a filler pipe cap;

an annular cover including a flat, circular top wall and a cylindrical side wall extending at a right angle relative to said top wall and hingedly secured directly to said base ring, the outside diameter of said side wall being substantially equal to the outside diameter of said base ring;

a first U-shaped lug member secured to said base ring and projecting outwardly therefrom comprising a pair of spaced, parallel vertically disposed arms;

a second lug member secured to said side wall of said annular cover projecting outwardly therefrom and adapted for insertion into space between said arms of said first lug member; and

an opening in each of said arms of said first lug member and in the second lug member, thereby forming three openings aligned to receive a padlock shackle when said cap cover is in the closed position, whereby a secure, tight closure for said tank is provided, said cap cover being secured to the fuel tank filler pipe by said filler pipe cap.

4,613,056

SEED METER HAVING CLEANOUT AND SEED SEALING MEMBER

Jay H. Olson, Rock Island, Ill., assignor to Deere & Company, Moline, Ill.

Filed Oct. 31, 1983, Ser. No. 546,829
Int. Cl.[4] B65H *3/08*
U.S. Cl. 221—211 **13 Claims**

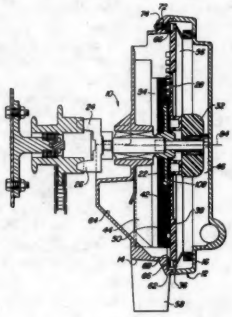
1. In a seed meter, the combination comprising:

a housing;

a seed disk rotatably mounted about an axis of rotation within the housing and having a generally circular outer edge;

the housing having a generally circular outer periphery and an opening therein adjacent at least a portion of the outer edge of the seed disk and defining a seed discharge area at a side of the seed disk; and

a cleanout and seed sealing member mounted within the housing adjacent the opening in the housing and the outer edge of the seed disk, the member extending around substantially the entire outer periphery of the housing except at the seed discharge area and forming a gap with the outer edge of the seed disk, the gap being smaller than each of a plurality of seeds to be contained with the housing and at the same time larger than certain debris which may occur within the housing so as to pass the debris therethrough.

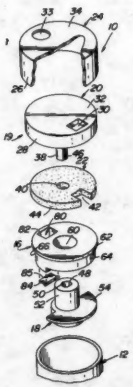


4,613,057

CLOSURE

John A. Sacchetti, 2665 Pleasant Hills Rd., Hatboro, Pa. 19040; Joseph R. Tordella, 128B Elm Dr., Medford, N.J. 08055, and Arthur J. Pellegrino, 353 Oxford Rd., Norristown, Pa. 19401

Filed Dec. 14, 1983, Ser. No. 561,387
Int. Cl.[4] B65H *3/00*
U.S. Cl. 221—265 **18 Claims**



1. A closure usable with a container for dispensing pills, capsules and the like, said closure being characterized by a one-way valve member for enclosing the container, and a rotary system for assisting in the dispensing operation, said

valve member including a valved passage means through a wall thereof and means for opening said valved passage means to permit dispensing from the container when said container is in an active dispensing orientation and for closing said valved passage means to prevent access to the container when said container is in an inactive non-dispensing orientation in any rotary position of the rotary system, said rotary system including an upper cap member and a bottom member, said upper cap member including a wall positioned above the wall of the one-way valve member through which the valved passage extends and including an egress passage therethrough, said bottom member being located beneath the wall through which the valved passage extends and being keyed to rotate with the upper cap member, said bottom member including a laterally projecting section aligned with the egress passage in the upper cap member for overlying the bottom of the valved passage when the egress passage of the upper cap member is aligned with the valved passage of the one-way valve member.

4,613,058

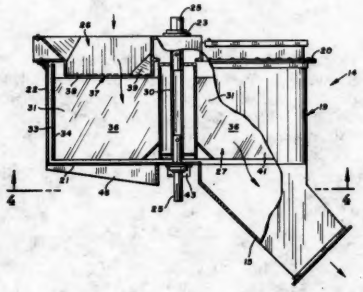
ROTARY VOLUMETRIC LOADING METER

Roger C. Conger, 111 SE. Bedford, Minneapolis, Minn. 55414

Continuation of Ser. No. 465,037, Feb. 7, 1983, abandoned. This application May 6, 1985, Ser. No. 731,123

Int. Cl.[4] G01F *11/10*

U.S. Cl. 222—36 **6 Claims**



1. A rotary drum metering feeder device comprising:

(a) a casing defining a generally cylindrical chamber, with said casing including a cylindrical housing with opposed closure plates including a top end plate and a bottom end plate;

(b) rotary drum means disposed within said chamber including a central shaft journalably retained within said top and bottom end plates on a substantially vertical axis, an outer sleeve, and a plurality of generally radially disposed blades secured at their inner ends to said central shaft and at their outer ends to said outer sleeve, and defining a plurality of metering chambers for retention of particulate solids therebetween;

(c) an inlet port formed within said top end plate and disposed at a first arcuate disposition between the inner and outer edges of said radially disposed blades;

(d) an outlet port formed within said bottom end plate between the inner and outer edges of said radially disposed blades, and disposed in arcuately displaced relationship to said inlet port to provide a closed arcuate web zone between each of said inlet port and said outlet port;

(e) said inlet port including a substantially vertically disposed planar edge surface and a canted edge surface together comprising a wiper blade means, with said canted edge surface being aligned with the radius of said drum means, and said planar edge surface extending non radially outward beyond said canted edge surface, and said canted edge surface being inclined with respect to the planer edge to define therewith an obtuse angle within said inlet port, said wiper blade means in close running clearance with each of said radially disposed blades so as to level the charge of particulate solids within each of said metering chambers rotatably passing from said inlet port to said outlet port; and

(f) means for determining the number of revolutions of said central shaft.

4,613,059

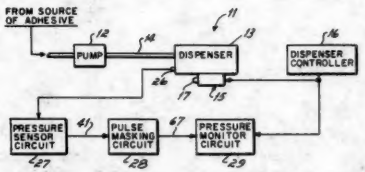
PRESSURE PULSE MASKING CIRCUIT FOR A PRESSURE MONITOR IN A DISPENSING SYSTEM

Stephen L. Merkel, Bay Village, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 15, 1985, Ser. No. 734,122

Int. Cl.[4] B67D *5/08, 5/14*

U.S. Cl. 222—52 **3 Claims**



1. In a hot melt adhesive dispensing system including (a) a dispenser for pressurized hot melt adhesive, (b) means for opening and closing an adhesive outlet of the dispenser to permit and prevent the dispensing of adhesive and resulting in variations in pressure of adhesive in the dispenser, including reduced pressure pulses occurring at times when the adhesive outlet is opened, (c) means for producing an electrical pressure sensor signal reflective of pressure variations in adhesive in the dispenser including pulse signals reflective of said reduced pressure pulses, and (d) means for monitoring an output electrical signal substantially during times that the adhesive outlet is open; a pulse masking circuit comprising:

pulse sensing means, coupled to said electrical pressure sensor signal, for sensing the occurrence of pulse signals reflective of reduced pressure pulses; and

means, coupled to the pulse sensing means and receiving said electrical pressure sensor signal, for modifying the electrical pressure sensor signal upon the sensing of the occurrence of one of said pulse signals by the pulse sensing means to produce the output electrical signal reflective of pressure variations in adhesive in the dispenser in which said pulse signals are replaced by masking signals, the output electrical signal being coupled to the monitoring means.

4,613,060

PRESSURE-GAS OPERATED DISPENSING MEANS FOR FLUIDS

Hans-Joachim Ulbrich, Brühl, and Horst Quester, Cologne, both of Fed. Rep. of Germany, assignors to Wilh. Quester Maschinenfabrik GmbH, Hurth, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,186

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346330

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—61 **10 Claims**

1. A gas pressure operated dispensing system for dispensing fluids, which comprises:

a first fluid container;

a second fluid container;

means for maintaining a pressure difference between said first and second fluid containers;

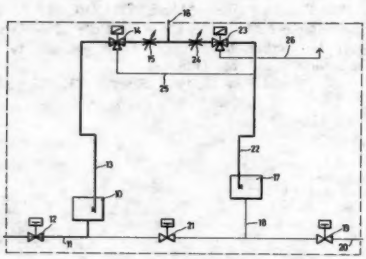
a first gas line connected to the first container and a second gas line connected to the second container;

gas pressure source means connected to said first and second gas lines, for supplying a pressurized gas thereto;

first change over valve means and second change over valve means disposed in said first gas line and said second line, respectively, for controlling gas flow through said first and second gas lines;

supply line means for introdicuing a fluid into said second container;

discharge line means for discharging a fluid from said first container;



fluid line means for communicating with the supply line means an outlet of, the second container, the discharge line means and an outlet of the first container, said fluid line means containing a third valve means disposed between the outlet of said second container and the outlet of said first container; and

vent line means, selectively connectible to said second gas line through said second change over valve means when said gas pressure source is separated from said second gas line by said second change over valve means for venting said gas line to the atmosphere.

4,613,061

VALVE FITMENT FOR A TWO-CHAMBER COMPRESSED GAS PACKAGING MEANS

Herbert Meuresch, and Wolfgang Fuhrig, both of Wiesbaden, Fed. Rep. of Germany, assignors to Deutsche Prazisions-Ventil GmbH, Hattersheim/Main, Fed. Rep. of Germany

PCT No. PCT/EP83/00261, § 371 Date May 17, 1984, § 102(e) Date May 17, 1984, PCT Pub. No. WO84/01557, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 6, 1983, Ser. No. 611,006

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237263

Int. Cl.⁴ B67B *7/24*

U.S. Cl. 222—82 **14 Claims**

Fig. 1

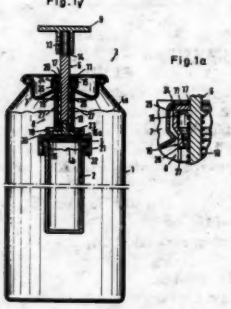


Fig. 1a

1. A valve fitment (**3;53**) for a two-chamber compressed gas packaging means for separately storing two components (***4a,4b***) of a product in an inner container (**2;52**) and an outer container (**1**) and for mixing the components within the outer container (**1**) directly before discharge of the mixture, comprising a cover (**7**), a discharge pipe (**6;56**) in a central through opening (**17**), an opening in the outer container (**1**), said cover (**7**) closing the opening in the container (**1**) and being smaller than the diameter of the outer container, further comprising a resilient annular seal (**11**) which seals the discharge pipe (**6;56**) against the through opening (**17**) and in which the discharge pipe (**6;56**) is guided for axial displacement from an outer limit position into an inner limit position, for piercing a wall portion of the inner container (**2;52**), and comprising a valve (**11,14**) which is manually actuable for triggering discharge of the mixture, characterised in that, on its inside, the cover (**7**) has a coupling means (**8;58**) for coupling the inner container (**2;52**) to the cover (**7**) which is disposed around the discharge pipe (**6;56**) and which has through openings (**23,27;23,63,77**) for the components (***4a,4b***) of the product, and that the valve (**11,14**) can be actuated by displacement of the discharge pipe (**6;56**) from the outer limit position in which the valve (**11,14**) is closed, by way of an intermediate position in which the wall portion of the inner container (**2;52**) is pierced and the valve is still closed, into the inner limit position in which the valve is opened.

4,613,062

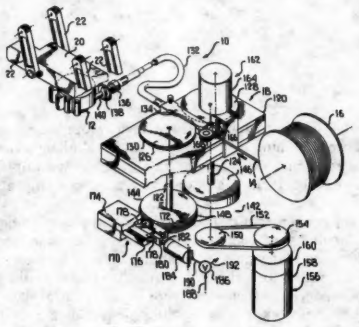
HOT MELT MATERIAL DISPENSER

John Walter, Evergreen Park, Ill.; Donald J. Roth, Westport, and Charles S. Kubis, Ewston, both of Conn., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Apr. 17, 1984, Ser. No. 601,404

Int. Cl.⁴ B67D *5/62*

U.S. Cl. 222—146.2 **13 Claims**

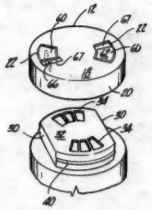


1. A hot melt material dispenser comprising a housing, supply means connected to said housing for supplying to said housing a continuous supply of hot melt material in solid rod-like form, heater means carried by said housing for heating said hot melt material to a fluid state, a cylinder in said housing, a piston in said cylinder, an actuator connected to said piston for moving said piston in said cylinder to pump flowable hot melt material from said cylinder, said piston having a pressure end portion which is hollow, a radially opening external opening through said piston into said hollow pressure end portion for delivering hot melt material through said piston into said cylinder below said piston, and a flow passage into said cylinder radially towards said piston for radial hot melt material flow through said radial opening into said piston in an at rest position of said piston.

4,613,063
DISPENSING PACKAGE

David M. Wright, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jan. 7, 1985, Ser. No. 689,161
Int. Cl.[4] B65D 55/02
U.S. Cl. 222—153 25 Claims



1. A safety dispenser comprising, in combination: a cylindrical container having an open bottom, cylindrical sidewall and a top formed with two diametrically opposed circular segments removed, establishing therebetween a closed bridge, said bridge containing a circumferential slot window; a cylindrical cap having a depending annular skirt and flat top; means affixing said cap to said container for rotation relative thereto; said cap having a circumferential slot dispensing window located on the flat top thereof so that when said cap is rotated, said cap window can be rotated from a first position wherein it is closed by said container to a second position in line with said container window for dispensing the contents of said container; a tamper indicating locking tab occupying a substantial portion of said cap dispensing window, said tab having a top surface attached to and forming a part of the top of said cap, said attachment being by frangible web means, said tab having a depending flange which engages the chordal surface formed by the removal of one of said opposed circular segments when said cap is initially assembled to said container in said first closed position, whereby said cap is locked in said closed position, and said web must be removed in order to rotate said cap to said second open position, the removal of said tab indicating initial opening or tampering of the dispenser; and a container bottom for closure of said container after filling with a product to be dispensed therefrom.

4,613,064
TILTING DISPENSER

Klaus Meyer, Neuss, and Dieter vom Hofe, Cologne, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 24, 1984, Ser. No. 633,811
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327627
Int. Cl.[4] G01F 11/26
U.S. Cl. 222—456 10 Claims

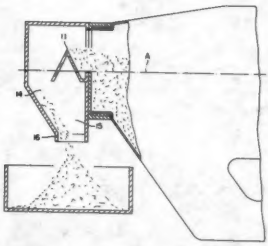
1. A tiliting dispenser for the measured release of a free-flowing solid wherein in use the dispenser is inverted once and the solid is released when the dispenser is tilted about 90° while returning it to its normal upright position, comprising:

an enclosed chamber housing with a base and a vertical inlet opening in said base, and a horizontal discharge outlet whose horizontal central axis is at about a 90° angle to said housing's vertical central axis;

means for flowingly coupling said housing to a container;

baffle means positioned within said chamber between said inlet opening and said discharge outlet and defining first an empty space between said baffle and said discharge outlet, second a metering chamber between said baffle and said inlet opening, and third a dispensing passage between said empty space and said metering chamber; said baffle means being a web comprising a V-shaped trough extending from one side of said housing to the opposite side and mounted on its side so that the inner portion of the trough is pointed at the discharge outlet and partially defines said empty space while the outer portion of the trough is pointed at the rear of said chamber housing and partially defines said metering chamber, and the free edge of said trough partially defines said dispensing passage;

means for horizontal displacement upon which said web is mounted substantially radially in relation to the housing vertical central axis and substantially parallel to the discharge outlet, so that the capacity of the metering chamber may be varied, said displacement means comprising horizontal guide slots in the lower part of each opposed side wall of said chamber housing and an elongated slide plate to which said web is fixed, said plate having two



opposed shoulders which project laterally through said respective guide slots, to permit guided horizontal displacement, and said plate having means for sealing those portions of said guide slots not occupied by said shoulders comprising sealing webs mounted on the ends of said slide plate interior of said shoulders and extending parallel to said guide slots;

so that when said tilting dispenser is inverted, said baffle means permits a measured quantitiy of solid to enter and fill said metering chamber and when said dispenser is tilted back about 90° with its discharge outlet pointed downward, only said measured amount flows from said metering chamber through said dispensing passage, into said empty space, and out said discharge outlet.

4,613,065
METHOD OF HANDLING HOSIERY

John W. Glaze, Jr., Charlotte, and Ernest E. Cline, Monroe, both of N.C., assignors to Intech Corporation, Charlotte, N.C.

Filed Apr. 23, 1985, Ser. No. 726,243
Int. Cl.[4] A41H 33/00; D06C 5/00
U.S. Cl. 223—37 8 Claims

1. A method of handling hosiery after the hosiery has been stripped from a form comprising the steps of:

(a) transferring hosiery one at a time from a stripping mechanism to an accumulating mechanism;

(b) vertically suspending the hosiery from the accumulating mechanism;

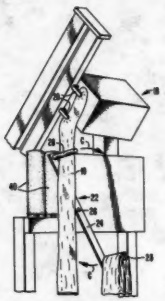
(c) straightening the hosiery by contacting the hosiery, while it is vertically suspended from the accumulating mechanism, with a stroking element and moving the stroking element over a portion of the hosiery's length;

(d) accumulating a desire member of hosiery in the accumulator mechanism by performing steps (a), (b) and (c) for the desired number;

(e) transfering the desired number of hosiery from the accumulator mechanism by:

(i) releasing the accumulated hosiery from the accumulator mechanism when the stroking element is in contact with the accumulated hosiery intermediate its length so

that the accumulated hosiery folds over the stroking element; and



(ii) moving the stroking element to a hosiery transfer location.

4,613,066

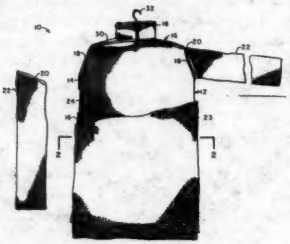
GARMENT DRYING FORM COMPRISING FLEXIBLE, CONFORMABLE MESH INSERT BODY

Jeannette E. Saucy, 2603 Barrett Ave., Richmond, Calif. 94804

Continuation of Ser. No. 212,823, Dec. 4, 1980, abandoned. This application Apr. 2, 1986, Ser. No. 848,834

Int. Cl.[4] A47G *25/20*

U.S. Cl. 223—66 **2 Claims**



1. A garment drying form for insertion within a sweater having a shape and size within a predetermined range so as to hold said sweater open and thereby facilitate drying of said sweater from its inside as well as its outside, comprising:

a first sheet of a flexible, foraminous, open-weave mesh, water-repellent material shaped to provide a container which conforms generally to the interior of said sweater,

a hanger positioned within a top portion of said container for suspending said container by the top end thereof,

the rest of said container being free of stays and bones so that said container is able to flex, be resilient, and readily assume any shape or configuration within said predetermined range of shapes and sizes,

a second sheet of flexible, foraminous, open-weave mesh, water-repellent material disposed in a generally random manner within and substantially filling said container so as to hold the walls of said container separated so that air can circulate within the interior of said container.

4,613,067

SHOOTING AND CARRYING SLING FOR GUNS

Larry N. Gann, Independence, Mo., assignor to Button Sling, Inc., Independence, Mo.

Continuation of Ser. No. 687,592, Dec. 31, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 823,137

Int. Cl.[4] F41C *23/02*

U.S. Cl. 224—150 **6 Claims**

1. A sling for carrying an elongated firearm by a waistbelt-clad wearer, said firearm having a trigger assembly normally retained by pin means situated within an opening in the firearm adjacent the trigger assembly, said sling comprising:

an elongated flexible strap provided with a front end portion and a rear end portion;

means for releasably coupling said rear end portion to the waistbelt of the wearer adjacent the wearer's back;

said strap being of a length for extending upwardly from said waistbelt coupling means along the back and over one shoulder of the wearer with said front end portion terminating above the wearer's waistbelt; and

means for attaching said firearm to said front end portion of said strap for supporting the firearm and permitting rapid movement of the firearm to a shoulder firing position without the necessity of delatching the firearm from the strap, said attachment means comprising

a stud for insertion into the firearm opening adjacent said trigger assembly; and

means for operatively and releasably connecting said stud and strap when the stud is operatively inserted into said firearm opening.

4,613,068

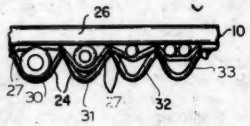
CARTRIDGE BELT

John E. Bianchi, 100 Calle Cortez, Temecula, Calif. 92390

Filed Nov. 5, 1984, Ser. No. 667,956

Int. Cl.[4] B65D *25/10*

U.S. Cl. 224—242 **6 Claims**



1. An improved cartridge belt including a belt and a buckle, the improvement wherein said belt includes on its outer surface a plurality of cartridge loops;

said cartridge loops extending longitudinally along the belt outer surface;

said cartridge loops comprising a series of outer loops sized to accommodate larger caliber cartridges;

a second set of cartridge loops within said first series of cartridge loops;

said second set of cartridge loops being formed by elastic material normally lying flat against the surface of the belt

but expandable outward by the insertion of a cartridge therein to hold smaller size cartridges.

4,613,069

METHOD FOR SOLDERING ALUMINUM AND MAGNESIUM

Wilbert L. Falke, St. James; Agnes Y. Lee, and Leander A. Neumeier, both of Rolla, all of Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 324,173, Nov. 23, 1981, abandoned. This application Jan. 6, 1984, Ser. No. 568,767

Int. Cl.[4] B23K *1/02*

U.S. Cl. 228—211 **7 Claims**

1. A process for soldering aluminum, magnesium, or their alloys, comprising initially applying thereto a thin coating consisting essentially of nickel-copper alloy, and subsequently soldering the coated metal by means of a tin-lead solder system.

4,613,070

METHOD OF MAKING COOKWARE

Al. S. Rummelsburg, Eastchester, N.Y., assignor to Kidde Consumer Durables Corp., Bronx, N.Y.

Continuation-in-part of Ser. No. 403,828, Jul. 30, 1982, Pat. No. 4,511,077. This application Apr. 15, 1985, Ser. No. 723,245

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] B23K *20/02*

U.S. Cl. 228—231 **13 Claims**

1. A method of making cookware comprising the steps of cleaning at least one surface of a preshaped stainless steel utensil having a bottom wall and an aluminum disk, separately heating said utensil bottom wall and disk in a manner which avoids hot spots until the temperature of the utensil is between 800°–1200° F. and the temperature of the disk is between 500°–750° F., positioning the heated disk with its cleaned surface overlying the cleaned bottom wall surface of said utensil and in direct contact therewith, bonding said surfaces directly together by applying pressure to the heated disk and utensil bottom wall, cooling the bonded members to a temperature less than about 250° F. and finally reheating the members to a temperature between 700° F. and about 950° F.

4,613,071

STEAM HEATING EQUIPMENT WITH CONDENSATE VESSEL AND RETURN LINE

Toshiaki Omori, Tokyo, Japan, assignor to Tokyo Gas Company, Ltd., Japan

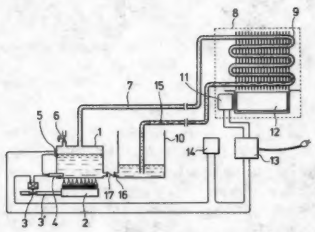
Filed Mar. 25, 1985, Ser. No. 715,473

Claims priority, application Japan, Mar. 23, 1984, 59-56939

Int. Cl.[4] F24D *1/00*

U.S. Cl. 237—9 R **7 Claims**

1. A heating system comprising a steam generator defining a space for receiving a liquid to be converted into saturated steam, a heating source associated with said steam generator for heating said steam generator to generate saturated steam therein, a steam conducting tube connected to said heat generator for conveying saturated steam, a heat emitter having a heat transfer tube connected to said steam conducting tube for receiving saturated steam to heat surroundings of said heat transfer tube whereby saturated steam in said heat transfer tube is condensed back to liquid after it gives up its heat to the surroundings, a condensed liquid vessel connected to said heat transfer tube for receiving condensed liquid and subjecting the condensed liquid to atmospheric pressure, a liquid circulation tube connected directly between said vessel and said steam generator for supplying condensed liquid from said vessel to said steam generator, valve means in said liquid circulation



tube for passing liquid from said vessel to said gas generator only, and control means for intermittently activating said heating source for generating saturated steam which is supplied to said heat transfer tube for giving up its latent heat and being condensed into liquid which is supplied to said liquid vessel, said steam generator cooling with said heating source deactivated to effect a reduction of pressure in said steam generator to draw liquid from said vessel to said steam generator over said circulation tube and through said valve means.

4,613,072

APPARATUS FOR HEATING FLUID BY BURNING LIQUID FUEL

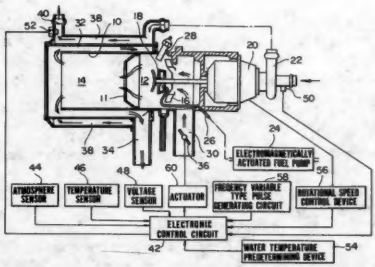
Kunio Kikuchi, Odawara, and Hidetoshi Umehara, Yaita, both of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 747,824

Claims priority, application Japan, Jul. 31, 1984, 59-116414[U]

Int. Cl.[4] B60H *1/02*

U.S. Cl. 237—12.3 C **6 Claims**



1. In an apparatus for heating fluid by burning liquid fuel, said apparatus including a cylindrical combustion chamber in which liquid fuel is burnt, a combustion air introduction passage through which combustion air is introduced into said combustion chamber, a combustion gas discharge passage through which combustion gas is discharged from the combustion chamber, a flow passage adjacent the combustion chamber and the combustion gas discharge passage in which said fluid receives heat from the combustion gas, a fuel pump for pumping fuel to the combustion chamber, a combustion air blower,

feed means for the fluid to be heated and a motor for rotating said combustion air blower and said feed means, the improvement comprising:

means for controlling the rotational speed of said motor;

means for controlling the fuel feed rate independent of said rotational speed;

means for controlling the flow rate of combustion air into the combustion chamber independent of said rotational speed and said fuel feed rate; and

an electronic control unit into which a variety of parameters relative to said means are inputted, said parameters being processed to individually control said means for controlling the rotational speed of the motor, said means for controlling the fuel feed rate and said means for controlling the flow rate of combustion air.

4,613,073

COMPOUND GLASS PANE CONSTRUCTION AND METHOD FOR HEATING THE SAME

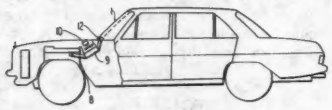
Hubertus Christ, Stuttgart, and Helmut Wulf, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 225,991, Jan. 19, 1981, abandoned. This application Jul. 30, 1985, Ser. No. 760,616

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3001565

Int. Cl.[4] B60H *1/02*

U.S. Cl. 237—12.3 R **29 Claims**



1. A process for heating a multiple-glass window pane with vapors in an interstice therebetween for the purpose of melting snow, ice or the like located on the outside of one outside pane and for defrosting the outside of another outside pane, comprising the steps of:

supplying heat directly into said interstice between the panes, and

heating the panes of the multiple-glass pane by condensing said vapors thereon.

4,613,074

PROCESS FOR CONTROLLING A HIGH-PRESSURE CLEANER AND HIGH-PRESSURE CLEANER FOR IMPLEMENTING SAID PROCESS

Werner Schulze, Winnenden, Fed. Rep. of Germany, assignor to Alfred Kärcher GmbH & Co., Winnenden, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,405

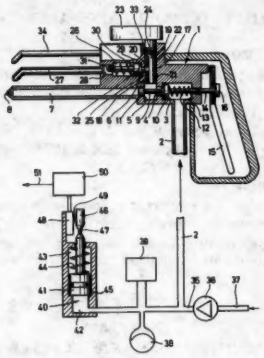
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311382

Int. Cl.[4] B08B *3/02*

U.S. Cl. 239—1 **14 Claims**

1. Process for controlling a high-pressure cleaner which discharges cleaning fluid through a spray nozzle, said cleaning fluid being delivered by a high-pressure pump through a high-pressure line provided with a closing valve, in which the high-pressure pump is switched on and off as a function of the pressure in the high-pressure line, whereby the pump is switched on when the pressure in the high-pressure line has fallen below the switch-on pressure, said switch-on pressure being below the operating pressure resulting when the high-pressure pump is in operation and the closing valve is wholly or partially open,

wherein to generate a control signal, a second, closable flow path is connected in parallel with the flow path through the spray nozzle, whereby, after the switching on of the pump, the pressure rise time in the cleaning fluid between a lower limit value P_u and an upper limit value P_o is determined and a control signal is generated by opening the second flow path to extend said rise time in comparison with the rise time with the second flow path closed.



4,613,075

ELECTROSTATIC SPRAYING

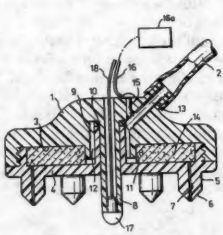
David J. Owen, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jun. 25, 1984, Ser. No. 624,109

Claims priority, application United Kingdom, Jul. 15, 1983, 8319227

Int. Cl.[4] B05B *1/14, 5/02*

U.S. Cl. 239—3 **12 Claims**

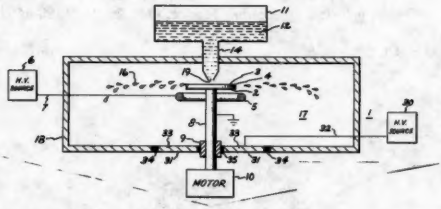


1. A method of electrostatically spraying a liquid from a plurality of nozzles comprising feeding said liquid from a common source under superatmospheric pressure, dividing said liquid via distributing means to form a plurality of streams, restricting the flow of each of said streams at, or downstream of, said distributing means by a flow restrictor, such that the pressure drop on each of said liquid streams across the flow restrictor is substantially greater than that given by the hydrostatic head corresponding to the maximum possible vertical displacement of said nozzles, feeding each of said liquid streams through a nozzle at a rate not exceeding 5×10^{-8} $m^3.s^{-1}$, and applying to each of said nozzles an electrical potential of such magnitude that said liquid emerging from said nozzles is atomized into electrically charged droplets.

4,613,076
APPARATUS AND METHOD FOR FORMING FINE LIQUID METAL DROPLETS

Peter W. Dietz, Delanson, and Russell S. Miller, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 580,321, Feb. 15, 1984, abandoned. This application Sep. 26, 1985, Ser. No. 780,138
Int. Cl.[4] B01J *2/04*; B05B *5/04*
U.S. Cl. 239—3 **23 Claims**



1. An apparatus for forming fine liquid metal droplets from a liquid metal comprising:

(a) a chamber wherein the pressure within said chamber is greater than about 1.5 atmospheres;

(b) a member rotatably mounted within said chamber and having a surface for receiving said liquid metal;

(c) means for delivering said liquid metal to said surface of said member;

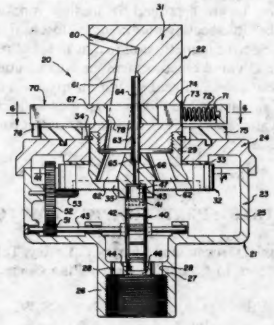
(d) means for forming an electrical field at least at the edge of said surface sufficient to overcome the surface tension of said metal; and

(e) means for rotating said member at a predetermined angular velocity.

4,613,077
PROGRAMMABLE SPRINKLER

Jeffry D. Aronson, 6721 Craig St., Fort Worth, Tex. 76112

Filed Apr. 9, 1984, Ser. No. 598,529
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—97 **7 Claims**



5. A sprinkler comprising

a body having a chamber, and a fluid inlet passage to said chamber;

a head rotatably mounted on said body, communicating with said chamber; said head having nozzle means for directing a fluid stream laterally relative to the axis of rotation thereof, and passage means communicating said nozzle means with said body chamber;

drive means including motor means for rotating said head relative to said body;

control valve means for varying the flow of fluid to said nozzle means;

coacting control means mounted on said body and said head, responsive to the rotation of said head relative to said body for controlling said control valve means;

motor means for driving said control valve means;

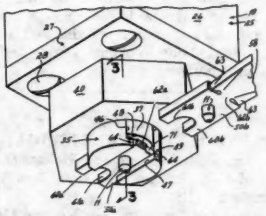
said control means including coacting indexing means mounted on said body and said head;

said indexing means including signaling means responsive to rotation of said head relative to said body for controlling the operation of said control valve motor means.

4,613,078
QUICK REPLACEABLE NOZZLE ASSEMBLY

Robert C. Marshall, Tucker, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Apr. 9, 1984, Ser. No. 598,428
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—390 **19 Claims**



1. The combination of a dispensing gun for dispensing liquids and a nozzle holder strip for inserting a nozzle into said gun, said combination comprising,

a gun body including a valve seat at one end thereof,

a liquid flow passage within said one end of said gun body, said flow passage extending through said valve seat,

a valve engageable with said valve seat,

a nozzle retainer mounted for axial movement upon said gun body, said retainer having an axial bore extending therethrough, a transverse slot extending through at least one side of said retainer and intersecting said axial bore of said retainer, and

a nozzle holder strip having a nozzle mounted thereon, said nozzle having an axial passage extending therethrough and terminating in a discharge orifice, and

said strip being insertable into said transverse slot of said retainer so as to position said nozzle in said retainer with said nozzle passage in communication with said liquid flow passage of said gun body.

4,613,079
FUEL NOZZLE WITH DISC FILTER

Robert T. Mains, Euclid, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 25, 1984, Ser. No. 664,464
Int. Cl.[4] B05B *1/34*
U.S. Cl. 239—462 **9 Claims**

1. A nozzle tip comprising:

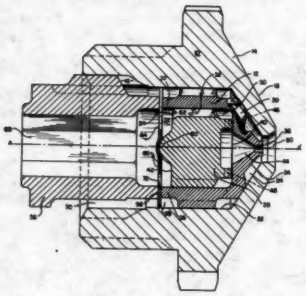
a nozzle body having at least one inner cavity and forming a discharge face with at least one discharge orifice therein, said nozzle body also providing a support surface adjacent the wall of said inner cavity;

a swirl plug that is maintained in the inner cavity of said nozzle body, said swirl plug having means for swirling fluid flowing through said inner cavity toward the discharge orifice of said nozzle body;

a filter that is maintained in the inner cavity of said nozzle

body, said filter having first and second oppositely disposed faces with the first face contacting both the support surface of said nozzle body and said swirl plug; and

a retainer plug that is removably secured in the cavity of said nozzle body, said retainer plug having a clamping surface



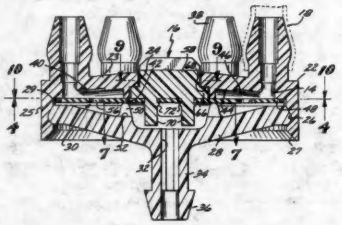
that contacts the second face of said filter and maintains the first face of said filter in contact with both the support surface and said swirl plug, such that said filter cooperates with said nozzle body to maintain said swirl plug in compression therebetween.

4,613,080

MULTIPLE OUTLET TRICKLE IRRIGATION UNIT

Briant E. Benson, Santa Barbara, and Richard D. Brown, Glendora, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Jun. 29, 1984, Ser. No. 626,130
Int. Cl.⁴ B05B *1/30*
U.S. Cl. 239—542 **24 Claims**



1. A trickle irrigation unit, comprising:

a valve housing defining an internal pressure chamber, an inlet port for inflow of water into the pressure chamber, and a plurality of outlet ports for discharge of water from the pressure chamber, said valve housing further defining a plurality of flow patterns within the pressure chamber and each communicating with a respective one of the outlet ports;

a resilient valve member within the pressure chamber overlying the flow patterns and outlet ports and having a plurality of flow passages formed therein in a predetermined array for alignment of a selected number of the flow passages with a corresponding selected number of the flow patterns to permit water flow from the pressure chamber into the selected number of flow patterns and further for discharge through the outlet ports associated therewith, said valve member being movable to different set positions having different selected numbers of the flow passages aligned with corresponding different selected numbers of the flow patterns; and

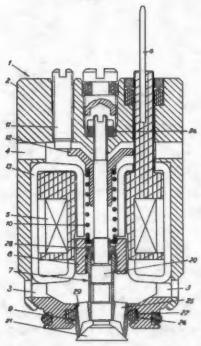
selector means movably mounted on said valve housing and accessible from the exterior thereof for moving said valve member to the different set positions for variably selecting the number of the outlet ports through which water discharge is permitted.

4,613,081

INJECTION VALVE FOR AN INTERNAL COMBUSTION ENGINE

Philippe Bauer, Marly le Roi, France, assignor to Societe Industrielle de Brevets et d'Etudes (S.I.B.E.), France

Filed Oct. 18, 1984, Ser. No. 662,074
Claims priority, application France, Oct. 20, 1983, 83 16712
Int. Cl.⁴ F02M *69/04*
U.S. Cl. 239—585 **8 Claims**



1. A fuel injection valve for internal combustion engine, comprising: a hollow body defining a fuel circuit adapted for connection with a source of fuel under pressure and having a passage opening outside of said body; a guide member of elongated shape located in said circuit, having a first end which is securely connected to said body inside said body and an other end portion which is enlarged and projects out of said body through said passage without contact with said body, said enlarged end portion being formed with a flaring valve seat surface; an annular valve closure member sealingly slidably mounted on said guide member for movement along said guide member; spring means arranged for biasing said annular valve closure member into sealing abutment against said flaring valve seat surface; electromagnetic coil means in said body for moving said annular valve closure member into an abutment position against the action of said spring means upon energization thereof, said annular valve closure member defining, with and around said valve seat surface, an annular outlet for delivery of fuel as a conical jet.

4,613,082

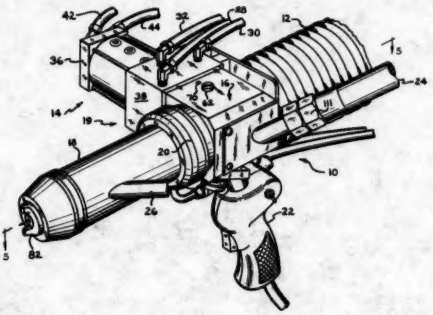
ELECTROSTATIC SPRAYING APPARATUS FOR ROBOT MOUNTING

James J. Gimple, Oregon, and Charles T. Lasley, Toledo, both of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Jul. 6, 1984, Ser. No. 628,397
Int. Cl.⁴ B05B *5/02*
U.S. Cl. 239—690 **7 Claims**

1. An electrostatic spraying apparatus, for robot mounting, comprising, in combination, a drive assembly for mounting on a robot arm, a spray gun base rotatably connected to said drive assembly, said drive assembly including a rotor and a drive shaft extending through a manifold and connected to said gun base, said manifold disposed between said rotor and said gun base, said drive assembly rotating said spray gun base through first and second paths of movement, selection means for prede-

terminately selecting said first and second paths of movement, a spray gun detachably mounted to said spray gun base, a coating supply line connected to said spray gun, securement means for securing said spray gun to said spray gun base, whereby said securement means allows removal of all coating contaminated parts from said spraying apparatus, a voltage



supply line positioned in said spray gun base, a plurality of air supply lines operatively connected to said manifold, said supply lines being in communication with said spray gun, said air supply lines remaining stationary relative to said spray gun base when said spray gun and base are rotated by said drive assembly.

4,613,083

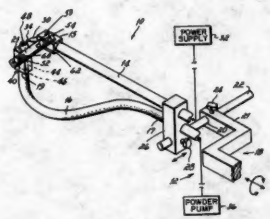
ADJUSTABLE POWDER SPRAY GUN

Douglas C. Mulder, Wellington, and David E. O'Ryan, Avon Lake, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jun. 21, 1984, Ser. No. 622,978

Int. Cl.[4] B05B 5/02

U.S. Cl. 239—707 **6 Claims**



1. Apparatus for applying a solid particulate powder coating to the interior surface of a target object, comprising:

a mounting block;

a hollow, rigid support member having a longitudinal axis, one end of said support member being mounted to said mounting block, the other, outer end of said support member mounting a powder charging electrode;

a high voltage cable carried with said hollow support member for connecting said powder charging electrode to a source of electrical power;

a nozzle including a flow passage having an inlet port at one end and a discharge orifice at the other end, said inlet port receiving solid particulate powder and said discharge orifice ejecting the solid particulate powder in a predetermined pattern from said flow passage;

an adjustment element connected between said nozzle and said outer end of said support member for positioning said discharge orifice of said nozzle proximate said powder charging electrode to electrostatically charge solid particulate powder ejected from said discharge orifice;

means connected to said adjustment element for adjusting the angle of said nozzle flow passage in said nozzle relative to said longitudinal axis of said support member;

a flexible tube for transmitting solid particulate powder, said flexible tube having an upstream portion fixedly connected to said support member and a discharge end fixedly connected to said inlet port of said nozzle flow passage;

said flexible tube being disposed in a plane oriented generally perpendicularly to said discharge orifice so as to direct the solid particulate powder substantially vertically upwardly through said nozzle flow passage;

said flexible tube being smoothly curved between said discharge end and said upstream portion so as to prevent powder from becoming entrapped in sharply angled corners of a powder flow path between said upstream portion of said flexible tube and said discharge orifice of said nozzle.

4,613,084

PROCESS FOR PRODUCING A COAL-WATER SLURRY

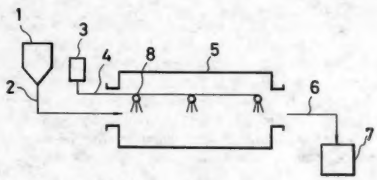
Shigehito Takamoto; Kazunori Shoji; Nobuyasu Meguri; Yoshinori Ohtani; Hirofumi Kikkawa; Yasuyuki Nishimura; Hiroyuki Kaku, all of Kure, and Masayasu Murata, Ohtemachi, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,245

Claims priority, application Japan, Jun. 28, 1983, 58-115246; Jul. 5, 1983, 58-121041; Sep. 7, 1983, 58-163328; Sep. 30, 1983, 58-182510; Sep. 30, 1983, 58-182512

Int. Cl.[4] B02C 19/12

U.S. Cl. 241—16 **15 Claims**



1. A process for producing a high concentration coal-water slurry in a continuously operating ball mill having a plurality of stage compartments respectively having different size balls, with the stages separated from each other by partition means through which the coal-water slurry passes, said method comprising:

feeding coal and water into a continuously operating ball mill wherein the ratio (L/D) of the length of the mill (L) to the diameter thereof (D) is less than 2;

passing the coal-water slurry serially through the plurality of stages in a milling direction, so that a broader width of particle size distribution is obtained than if L/D were greater than 2, resulting in less viscosity and a higher coal concentration; and

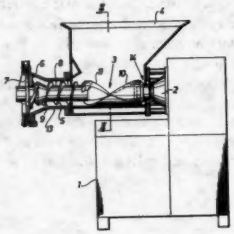
adding a dispersing agent separately and directly into each of a plurality of the stages in the milling direction of the coal within the ball mill, in amounts adjusted to the surface area of the coal at each stage, so that less dispersing agent is used than if it were all added at once when obtaining the same coal concentration and so that a greater coal concentration is obtained than if the dispersing agent were all added at once when obtaining the same viscosity.

4,613,085

COMMINUTING MACHINE WITH FEED WORM, ESPECIALLY FOR COMMINUTING FROZEN MEAT

Knud Simonsen, Strudsbergsvej 44, 4200 Slagelse, Denmark

Filed Aug. 16, 1984, Ser. No. 641,338
Claims priority, application Denmark, Aug. 17, 1983, 3760/83
Int. Cl.[4] B02C *18/30*
U.S. Cl. 241—82.5 9 Claims



1. A mechansim for cutting-up blocks of frozen meat, said mechansim comprising:

a feed hopper, and

a cutting feed worm located adjacent to a bottom of said feed hopper for cutting up blocks of frozen material during rotation of said cutting feed worm, said cutting feed worm including two ends, said two ends being supported to transmit a driving force from one end of said cutting feed worm to the other end of said cutting feed worm sufficient to cut frozen blocks of material, said cutting feed worm including a coreless single worm convolution an innermost surface of said single worm convolution defining an arcuate surface spaced a constant radial distance from an axis of rotation of said single worm convolution throughout its length formed by cutting away at least one-half of the cross-sectional area of said single worm convolution, said thick-walled tube defining a surface facing forward in a direction of rotation of said single worm convolution for cutting a lowermost portion of a block of frozen material which has been lowered into said hopper and defining a surface facing rearward in said direction of rotation of said single worm convolution, said surface facing forward and said surface facing rearward extending substantially in a helical manner relative to said axis of rotation of said single worm convolution.

4,613,086

FOOD PROCESSING MACHINE

Michael J. Granum, 14590 SE. 262, Boring, Oreg. 97009, and Walter J. Steffan, P.O Box 116, Tygh Valley, Oreg. 97063

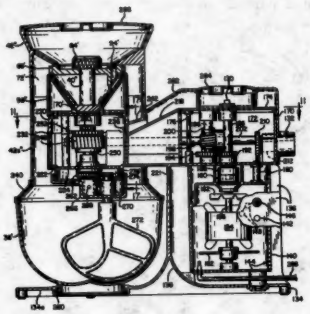
Continuation-in-part of Ser. No. 417,410, Sep. 13, 1982, abandoned. This application Jul. 10, 1984, Ser. No. 629,262
Int. Cl.[4] B02C *9/04*
U.S. Cl. 241—101 B 6 Claims

1. A bread dough making machine comprising:

(a) having inverted cone-shaped member having upper end and a lower ends;

(b) a base member having a tapered recess with a defining wall receiving said cone-shaped member, the wall of said recess being shaped to provide a grinding area between the wall and said cone-shaped member with said grinding area being progressively less toward the upper end of said cone-shaped member, said grinding area having outlet means, at least one of said base member and cone-shaped member having a grinding surface and at least one of said base member and cone shaped member being rotatable relative to the other of said base member and cone shaped member for reducing grain to a smaller particulate form, said grinding area having a closed bottom end at the lower end of said cone-shaped member, and said cone-shaped member forcing ground grain upwardly and discharging it from the upper end of said cone-shaped member,

(c) power drive means for rotatably driving said cone-shaped member;



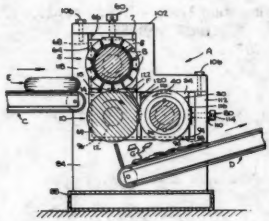
(d) means arranged to feed grain to be ground into said grinding area; and a mixing arm on said power drive means arranged to mix ground grain from said grinding means with other bread ingredients and simultaneously to knead the ingredients into bread dough.

4,613,087

SCRAP TIRE CUTTING APPARATUS

Robert H. Snyder, Grosse Pointe Park, Mich., assignor to Uniroyal Tire Company, Inc., Middlebury, Conn.

Filed Jun. 13, 1983, Ser. No. 504,017
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—111 31 Claims



1. Apparatus for cutting scrap tires, comprising;

(A) a frame;

(B) a cylindrical anvil roll mounted in said frame for rotation about its longitudinal axis;

(C) a first blade roll mounted in said frame adjacent to said anvil roll for rotation about an axis parallel to the rotational axis of said anvil roll;

(D) a plurality of roller blades fixed to said blade roll and rotatable therewith so that said blades and said anvil roll define a first nip therebetween into which tires to be cut can be drawn and cut up into strips, said roller blades circumscribing a corresponding cylinder of a predetermined diameter during rotation of said blade roll;

(E) a second blade roll mounted in said frame adjacent to said anvil roll for rotation about an axis parallel to the rotational axis of said anvil roll;

(F) a second plurality of roller blades fixed to said second blade roll and rotatable therewith so that said blades and said anvil roll define a second nip therebetween, angularly spaced from said first nip, into which said strips can be drawn and cut up into pieces of prescribed size said second plurality of roller blades circumscribing a corre-

sponding cylinder of a predetermined diameter during rotation of said second blade roll;

(G) drive means for rotating said anvil roll in one direction and said first and second blade rolls in an opposite direction to draw scrap tires into said first nip and to draw cut strips into second nip;

(H) a first pair of axially spaced thrust wheels carried by said first blade roll and a second pair of axially spaced thrust wheels carried by said second blade roll,

(1) the thrust wheels in each pair of thrust wheels being positioned outboard of the roller blades on the corresponding blade roll,

(2) the thrust wheels in each pair of thrust wheels being at least equal in diameter to the predetermined diameter of the cylinder circumscribed by the peripheries of the roller blades on the corresponding blade roll; and

(I) biasing means constructed and arranged to force said blade rolls relatively toward said anvil roll to bring the outer peripheries of said anvil roll and said thrust wheels into hard contact with one another, thereby to maintain predetermined positional relationships between the peripheral surfaces of the roller blades and the peripheral surface of the anvil roll notwithstanding the separating forces generated therebetween due to the movement therethrough of scrap tires and strips thereof being cut between such surfaces.

4,613,088

ARRANGEMENT FOR REINFORCING AND SPACING ANNULAR DISKS OF A HAMMER ROTOR

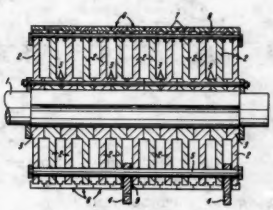
Dietrich Häusler, Vellmar, and Horst Schwarz, Söhrewald, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,633

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327204

Int. Cl.⁴ B02C *13/00*

U.S. Cl. 241—197 **1 Claim**



1. In an arrangement for reinforcing and spacing annular disks of a hammer rotor, said disks being fixedly mounted on a rotor shaft having an axis of rotation; pivotable hammers being disposed between various ones of said annular disks in such a way as to be offset over the periphery of said rotor, and in such a way as to be spaced from one another; those hammers located in a row when viewed in the axial direction of said rotor shaft being replaceably mounted on a common supporting rod so that all hammers located close to one another in a row are pivoted in common on the same supporting rod; several such supporting rods being provided angularly spaced from each other, each being parallel to said axis of rotation; the improvement in combination therewith comprising:

a plurality of replaceable, U-shaped strips placed on each annular disk in the circumferential direction thereof for reinforcing and spacing therewith so that thinner disks can be used; means for mounting said U-shaped strips structurally separate from said hammers; each of said strips having a crosspiece, two long sides, and two ends; the crosspiece of a strip on a given annular disk rests against the crosspiece or crosspieces of the adjacent strip or strips of other annular disks; on a given annular disk, each intersection of abutting ends of two strips which abut one another positively being located in a radial plane in which is also located one of said supporting rods for said hammers and extends in axial direction; each of said crosspieces of each of said strips, on at least one of said long sides thereof, and near at least one of said ends thereof, being provided with at least one cutout, the dimensions of which correspond approximately to the radius of pivot of said hammers which can be pivoted by 360°, and approximately to half the width of said hammers; each of said strips including prong-like legs which are connected to said crosspiece and extend over both sides of a given annular disk; each of said legs having a hole which extends transverse to the plane of the associated annular disk; each of said annular disks being provided with corresponding holes; and including, for each row of strips, when viewed in the axial direction of said rotor shaft, a mounting rod which extends through said holes of said legs and through holes of said annular disks to secure said strips to said disks so that with the arrangement for reinforcing and spacing, the supporting rods with the hammers mounted thereon, as well as the mounting rods with the U-shaped strips associated therewith, each can be replaced individually in a simple and rapid manner without having to disturb any adjacent U-shaped strips and hammers; said supporting rods for said hammers being disposed on an imaginary circle which is concentric to said rotor shaft; said mounting rods for said strips each being parallel to said axis of rotation of said rotor shaft and being disposed on an imaginary circle which is concentric to said circle of said supporting rods arranged one after the other in the direction of rotation of the rotor; and each of said mounting rods being disposed on a line which bisects the angle formed by two adjacent supporting rods, with the center of said rotor shaft being the apex of said angle.

4,613,089

YARN WINDING APPARATUS

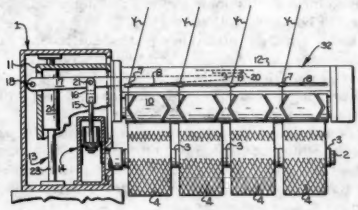
Gerd Münnekehoff, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,508

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417258; Dec. 20, 1984, 3446444

Int. Cl.⁴ B65H *54/42, 54/52*

U.S. Cl. 242—18 DD **14 Claims**



1. An apparatus for winding a high speed running yarn or the like, and comprising

a frame,

a winding spindle having one end thereof rotatably mounted to said frame so as to extend outwardly in a longitudinal direction and so as to be adapted to coaxially mount at least one bobbin tube thereon,

a slide comprising an end portion and a support arm extending outwardly in a longitudinal direction from said end portion, and with said support arm mounting yarn traverse means,

means mounting said end portion of said slide to said frame

with said support arm overlying said winding spindle in cantilever fashion, and so that said yarn traverse means is adapted to operatively engage and traverse a yarn on each of said bobbin tubes mounted on said spindle and rotated therewith to form a wound package thereon, and with said mounting means permitting relative sliding movement between said slide and said frame to accommodate the build of a package on each of the bobbin tubes on said spindle, and

force transmitting means supporting at least a substantial portion of the weight of said slide, said force transmitting means engaging said support arm of said slide at a medial location along its cantilevered longitudinal length to thereby minimize the moment force acting upon said mounting means of said slide resulting from the weight distribution of said slide and the outwardly extending support arm, and thereby also facilitate relative sliding movement between said slide and said frame.

4,613,090

YARN WINDING APPARATUS OF AUTOMATIC BOBBIN CHANGING TYPE

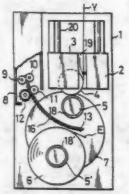
Takami Sugioka, Matsuyama, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Feb. 26, 1985, Ser. No. 705,627

Claims priority, application Japan, Mar. 2, 1984, 59-30406

Int. Cl.[4] B65H *67/048*

U.S. Cl. 242—18 A **6 Claims**



1. A yarn winding apparatus of automatic bobbin changing type comprising:

a turret turnably mounted on a machine frame;

a plurality of bobbin holders which are rotatably supported on said turret and which receive bobbins;

said bobbin holders being alternately located at a yarn winding position where a yarn is wound onto one of said bobbins to form a full bobbin and at a doffing position where said full bobbin is doffed;

a separator which is formed in a plate shape having a cross-section of an arc of a circle and which is movable from a standby position located at a side of said bobbin holders to a separating position located between said yarn winding position and said doffing position;

means connected to said separator for sliding said separator in a lengthwise direction of said separator and about the axis of said arc of said separator so that a front end of said separator moves across an imaginary line connecting centers of said bobbin holders.

4,613,091

COP TRANSPORTING SYSTEM FOR AN AUTOMATIC WINDER

Masaharu Kiriake, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

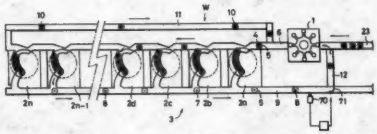
Filed Mar. 9, 1983, Ser. No. 473,704

Claims priority, application Japan, Mar. 13, 1982, 57-40025

Int. Cl.[4] B65H *67/02, 67/06*

U.S. Cl. 242—35.5 A **5 Claims**

1. A cop transporting system for transferring cops carried on trays between a spinning frame and an automatic winder of the type which has a winding apparatus including a plurality of winding units for winding up yarns of said cops, comprising: a cop transporting conveyor adjacent said winding units for transporting said cop carrying trays from said spinning frame to said winding units, said cop transporting conveyor having a first end and a second end, a returning conveyor adjacent said winding units for transporting said trays from which said cops have been removed from said winding units to said spinning frame, diversion means adjacent each of said winding units for selectively diverting said cop carrying trays transported on



said transporting conveyor away from said winding units, a surplus cop recirculating conveyor communicating with said second end of said cop transporting conveyor for returning said diverted cop carrying trays to said first end of said cop transporting conveyor, said transporting conveyor and said recirculating conveyor being configured to accept said cop carrying trays at random intervals as said cop carrying trays are delivered to said conveyors.

4,613,092

SPINDLE ASSEMBLY FOR WINDING MACHINE

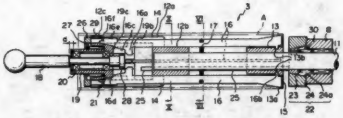
Shoji Nakai, Ibaraki, and Koji Akimoto, Itami, both of Japan, assignors to Kamitsu Seisakusho Ltd., Hyogo, Japan

Filed Mar. 12, 1985, Ser. No. 710,868

Claims priority, application Japan, Mar. 16, 1984, 59-49327

Int. Cl.[4] B65H *54/547, 75/30*

U.S. Cl. 242—46.4 **4 Claims**



1. A spindle assembly for a winding machine of the type having a rotatable spindle for supporting a bobbin thereon which is to have a yarn wound said bobbin, and a traverse device from which said spindle moves away in accordance with an increase in the amount of yarn wound on the bobbin, said spindle assembly comprising:

a bearing mechanism swingably supported on a machine frame of the winding machine,

a spindle having a rear end thereof rotatably supported about an axis thereof by said bearing mechanism, and an opposite, free end,

an operating handle slidably movable parallel to the axis of the spindle,

a plurality of bobbin holding members movable in a radial direction relative to the spindle,

expander means for pushing the bobbin holding members outwardly in the radial direction to hold a bobbin when the operating handle is slidably moved in a first direction and for drawing the bobbin holding members inwardly in the radial direction to release said bobbin when the operating handle is slidably moved in a second, opposite direction, said expander means being mounted on the spindle, attached to said operating handle and in engagement with said bobbin holding members, pander means mounted on the spindle, attached to said operating handle and in engagement with said bobbin holding members,

rotation stopping means secured to the bearing mechanism for braking said spindle or for permitting said spindle to

rotate in dependence on the direction of slidable movement of said operating handle, and

wherein swinging movement of the spindle cradle to the machine frame, the operation of holding a bobbin on and releasing a bobbin from the spindle, and the operation of actuating the rotation stopping means are accomplished by the sliding operation of the operating handle.

4,613,093

APPARATUS FOR LOOPING BELT-LIKE MATERIALS

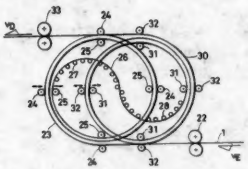
Yoshio Takakura, Hitachi; Ryo Abo, Toukai; Isamu Ishiyama; Toshiyuki Kajiwara, both of Hitachi; Tetsuya Higuchi, Katsuta; Teruo Yamaguchi; Hiromitsu Mitsui, both of Hitachi; Yoshihisa Furuzono, Aikawa, and Shunichi Hamada, Toyonaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 577,818, Feb. 7, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 804,609

Claims priority, application Japan, Feb. 9, 1983, 58-18800

Int. Cl.[4] B65H *20/24, 20/26*

U.S. Cl. 242—55 **4 Claims**



1. An apparatus for looping belt-like materials, the apparatus comprising first and second looping means for winding a moving belt-like material helically into first and second coils, said first and second looping means being arranged so as to have a common substantially horizontally disposed axis, means for drawing out a portion of said belt-like material from an innermost portion of said first coil to an innermost portion of said second coil, a plurality of first support rollers annularly arranged along an inner circumference of said first coil, a plurality of second support rollers annularly arranged around an inner circumference of said second coil, a rotary frame supporting said drawing out means and said first and second support rollers, said rotary frame being rotatable on the same axis as the first and second coils, driving means for driving said rotary frame, and means for displacing said first support rollers radially outwardly and said second support rollers radially inwardly at all times so as not to change the radial position of the belt-like material in said first and second coil until the belt-like material is drawn out from said respective first and second coils, whereby said first and second coils respectively rotate as a unitary body without any slipping of the belt-like material in said first and second coils.

4,613,094

TREAD ROLLER APPARATUS

William K. Schweitzer, 35045 Mustang, Sterling Heights, Mich. 48077

Filed Apr. 1, 1985, Ser. No. 718,797

Int. Cl.[4] B65H *18/16, 75/42*

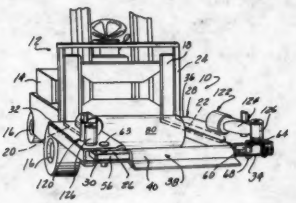
U.S. Cl. 242—86.52 **10 Claims**

8. Apparatus for rolling up and transporting treads comprising, in combination:

a pair of arms for mounting on a vertically movable portion of a transporter vehicle in laterally spaced apart relation;

means on said arms for engaging a tread to be rolled and inducing a curl in the tread as the transporter vehicle moves along the tread and said means moving out of curl-inducing engagement with the tread as the tread roll is formed; and

means on the arms for forming the tread into a multi-layered roll as the transporter vehicle continues to move along the



tread after disengagement of the first mentioned means from the tread.

4,613,095

PLATE SPRING FOR A TAPE CASSETTE

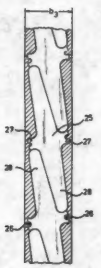
Klaus Schoettle, Heidelberg; Herbert Dietze, Berghaupten; Juergen Dreyer, Ruelzheim; Eugen Kamm, Appenweier; Peter Wieme, Ludwigshafen, and Volker Frank, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 664,798

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 8330710[U]

Int. Cl.[4] G03B *1/04;* **G11B** *15/32, 23/04*

U.S. Cl. 242—198 **6 Claims**



4. A tape cassette, in particular video tape cassette, having a top portion and a bottom portion, a pair of rotatable tape reels therebetween, and

a plate spring having two long spring arms for resiliently urging said tape reels toward the bottom portion of said cassette, and, extending transversely and centrally from said psring arms, a pair of shorter fastening arms for affixing said plate spring to the underside of said top portion,

said plate spring being symmetrical about its straight longitudinal axis and the length of said fastening arms being approximately the same as the width of the end of each spring arm,

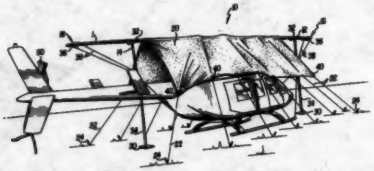
whereby, with said plate spring being cut out from a multi-plate-spring sheet metal strip in a pattern in which the end of a spring arm of one plate spring is adjacent a fastening arm of a neighboring plate spring, the contours of adjacent plate springs can be made virtually contiguous to each other and a corresponding saving in strip material be achieved.

4,613,096

HELICOPTER PROTECTOR

Billy G. Pugh, Corpus Christi, Tex., assignor to Billy Pugh Co., Inc., Corpus Christi, Tex.

Filed Feb. 23, 1984, Ser. No. 582,909
Int. Cl.[4] B64D 47/00
U.S. Cl. 244—1 R 6 Claims



1. A helicopter protector designed to protect the exterior of a helicopter from exposure to the elements and at the same time allow servicing of the helicopter, comprising:

main rotor support means, including two main rotor support holders; each of said main rotor support holders having a base portion, a cradle portion and adjustable pole sections extending between the base portion and the cradle portion;

main rotor tie-down means, including two main rotor tie-downs, each of said main rotor tie-downs having a pocket portion adapted to fit over an end of the main rotor and two flexible straps; each of said straps having a first end adapted for attachment to the pocket portion, a second end adapted for attachment to a stationary portion of the helicopter, and a flexible intermediate portion between said ends adapted to be wrapped around the adjustable pole sections of the main rotor support holders;

protective covering means, including a flexible sheet of water impermeable protective covering material and a yard boom; said sheet having a cap portion adapted to fit over the main rotor drive system of the helicopter located in a central portion thereof, an elongated pocket adapted to receive the yard boom attached to the sheet at a point near the cap portion, and a plurality of eyelets located along the periphery of the sheet on two sides of the sheet opposite each end of the yard boom; and

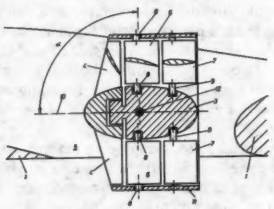
securing means, including a plurality of ground stakes and tension-binding straps, each of said straps having a first end adapted for attachment to the eyelets of the sheet and a second end adapted for attachment to the ground stakes.

4,613,097

RIGID WING FLYING CRAFT

Heinz Jordan, Wölfnitz bei Klagenfurt, Austria, assignor to Technische Gerate-u. Entwicklungsgesellschaft m.b.H, Klagenfurt, Austria

Filed Aug. 18, 1983, Ser. No. 524,460
Claims priority, application Austria, Aug. 30, 1982, 3243/82
Int. Cl.[4] B64C 11/00, 15/12, 29/00
U.S. Cl. 244—12.4 4 Claims



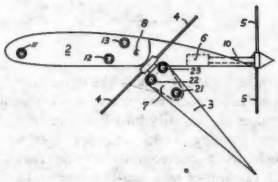
1. A rigid wing flying craft comprising at least one airfoil, at least one driving unit and a cabin for receiving loads, wherein at least one air channel piercing the airfoil is provided generally in the surface center of the airfoil for the airstream generated by the driving unit, at least two steering fins for steering flight movements are pivotally supported in the air channel near the mouth thereof, a radial guide vane system with guide vanes is provided coaxial with the axis of said driving unit for generating a counter torque, said steering fins and said guide vanes are pivotally supported around axes of rotation extending essentially perpendicular to the axis of said driving unit, said driving unit is pivotally supported to at least one inclined position in relation to said airfoil, and a common shell is provided surrounding said driving unit, guide vane system and steering fins whereby said steering fins are located in the airstream at any position of said driving unit, wherein said guide vanes are pivotally supported on said driving unit, on the one hand, and on said common shell, on the other hand, while said steering fins are pivotally supported on said driving unit only.

4,613,098

DEVICES WHICH MAY BE BORNE IN AIR AND ON DEVICES APPLICABLE THEREIN

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 308,202, Oct. 2, 1981, Pat. No. 4,452,411. This application May 10, 1984, Ser. No. 609,056
Int. Cl.[4] B64C 3/38
U.S. Cl. 244—46 3 Claims



1. An aircraft, comprising, in combination;

a body with a pair of first wing portions which extend laterally from said body with one portion of said portions extending to the left from said body and the other of said portions extending to the right from said body whereby said portions form a set of first wing portions relative to said body, a power plant, at least one pair of propellers with transmission means to transfer the power from said power plant to said propellers to revolve said propellers and a pair of second wing portions with one portion of said second wing portions extending to the left from said body while the other portion of said second wing portions extends to the right from said body;

wherein said second wing portions are inclinable downwards with their rear ends relative to first wing portions;

wherein said first wing portions are the main wings which are provided fixed to the body of the craft to carry the body of the craft as an aircraft flying on said first wing portions forward with relative high forward speed;

wherein said second wing portions are located behind said first wing portions and provided with propellers before them with axes of said propellers in a fixed angle relative to the medial line of the chord of said second wing portions;

wherein said second wing portions are variable between a rearmost location and a frontmost location and in any location therebetween;

wherein said rearmost location is defined by a downwards inclination of the rear ends of said second wing portions relative to said first wing portions;

wherein said propellers are revolved at said rearmost location of said second wing portions to create an airstream

over at least said second wing portions while partially sucking an airflow over said first wing portions; and;

wherein said propellers are insertable into respective spaces in said first wing portions to stop their revolving and to set them in a position parallel to the rear ends of said first wing portions while said rear ends of said first wing portions are provided with containment spaces to temporarly receive therein said propellers

and said propellers are located in said containement spaces and said second wing portions are moved forward to obtain said frontmost location while said frontmost location is obtained when said second wing portions are moved towards said first wing portions to combine with said first wing portions to a single pair of wing portions with said propellers set to rest in said containment spaces.

4,613,099

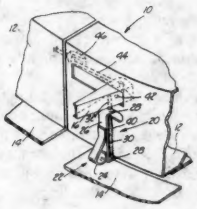
LATCH SIGNAL AND COWLING STRUCTURE

Keith O. Smith, and Jerry L. Glancy, both of Wichita, Kans., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 346,375, Feb. 5, 1982, abandoned. This application Sep. 13, 1984, Ser. No. 650,260

Int. Cl.⁴ B64C *1/14*; E05C *19/12*

U.S. Cl. 244—53 R **8 Claims**



1. A latch signal and cowling structure, the structure surrounding a jet engine and the like, the signal and structure comprising:

a split internal cowling surrounding the engine;

a split external cowling surrounding the internal cowling;

an internal latch mounted on one of the split internal cowlings for securing together the internal cowling, the latch having an aperture therein;

a handle assembly slidably mounted on the internal cowling; and

a plunger attached to the handle assembly, the plunger having an end portion adapted for receipt in the aperture of the internal latch when the internal latch is in a closed position, the end of the plunger resting against a side of the latch when the latch is in an opened position, the handle assembly extending outwardly from the internal cowling when the end portion of the plunger rests against the latch thereby preventing the surrounding external cowling from closing and signalling that the split internal cowling needs to be properly closed and latched.

4,613,100

AIRCRAFT EJECTION SYSTEM

John S. Martin, Denham, Nr. Uxbridge, England, assignor to Engineering Patents & Equipment Limited, St. Peter, Channel Islands

Filed Aug. 11, 1983, Ser. No. 522,393

Int. Cl.⁴ B64D *25/10*

U.S. Cl. 244—122 AD **6 Claims**

1. An ejection system for an aircraft for two airmen, comprising:

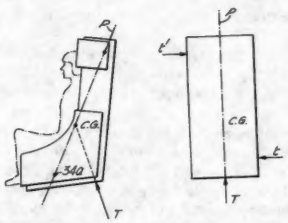
an ejection seat for each airman; and

means for ejecting the ejection seat/airman combinations from the aircraft so that the combinations travel along respective paths divergent from one another, said means including, for each seat/airman combination,

a primary rocket motor,

a further, lateral thrust rocket motor,

means mounting the primary rocket motor for accelerating the combination in a predetermined direction relative to the seat/airman combination by producing a thrust vector extending through or substantially through the centre of gravity of the combination, and having a substantial component along the principal axis of the combination, said principal axis being that axis of the airman/seat combination about which the combination is rotationally balanced and which lies closest to parallelism with the vertical centre line of the airman, said principal axis extending through or substantially



through the centre of gravity of the combination but being non-parallel to said thrust vector, and

means mounting the further, lateral thrust rocket motor for producing a further thrust vector which extends laterally with respect to the fore and aft axis of the seat in a direction transverse to the direction of the thrust vector produced by the primary motor, but which passes through, or substantially through the principal axis of the seat/airman combination, at a position spaced from said centre of gravity, so as to produce a rotational moment acting on the combination,

wherein the lateral thrust motor associated with each ejection seat is arranged to produce a rotational moment acting on the seat in the opposite rotational sense from the rotational moment acting on the other seat.

4,613,101

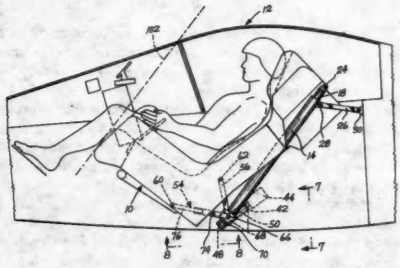
APPARATUS FOR REPOSITIONING AIRCRAFT EJECTION SEAT DURING THE EJECTION SEQUENCE AND METHOD

Gerald F. Herndon, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1984, Ser. No. 656,092

Int. Cl.⁴ B64D *25/10*

U.S. Cl. 244—122 R **20 Claims**



1. Apparatus for repositioning an aircraft ejection seat dur-

ing the ejection sequence, from a semi-reclined position to a more upright position for safer ejection, comprising:

ejection means for being connectable to an ejection seat to carry the seat out of the aircraft;

ejection force delivery means for supporting said ejection means and for supplying force to the ejection means to eject the ejection means from an outer end of the force delivery means and the seat from the aircraft;

seat support means including the ejection means, the force delivery means, means for connection to the seat having means engaged with the force delivery means for ejection with the seat and for disengagement from the delivery means at said outer end, and means for connecting the delivery means to the aircraft;

said means for connection to the seat including collapsible truss structures attachable to the lower part of the seat and for holding the seat away from a lower inner end of the force delivery means and firmly in a semi-reclined position;

triangular truss means for preventing the seat from moving rearwardly in the semi-reclined position, said triangular truss means including the seat, the force delivery means and ejection means forming first links of fixed length prior to ejection, stop means on the force delivery means for preventing the means engaged with the force delivery means from moving downwardly, and compression second links pivotally engaged at one of their ends with said last means engaged and having their other ends securable to the seat, said compression links forming parts of the collapsible truss structures,

whereby during ejection, as the ejection means move outwardly, the force delivery and ejection means first links lengthen so as to cause the compression second links to collapse in rotation toward the force delivery means causing the seat to move rearwardly from the semi-reclined position to more upright position and causing the other parts of the collapsible truss structures to collapse.

4,613,102

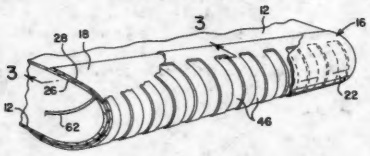
PNEUMATIC DEICERS WITH TEMPLATE

Pedro W. Kageorge, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 21, 1985, Ser. No. 703,958

Int. Cl.[4] B64D *15/18*

U.S. Cl. 244—134 A **11 Claims**



1. A pneumatic deicer adapted to be secured to an airfoil surface and which has a plurality of expansible and contractible portions for breaking up and removing accumulated ice, said deicer including:

a deformable sheet of fluid impervious resilient material;

a rigid template secured to the outer face of said deformable sheet, said template having apertures corresponding to the plurality of expansible and contractible portions of said deicer which apertures allow deformations therethrough of said sheet; the remaining regions of said template restraining deformation of said sheet; and

means to couple said deicer to a source of fluid such that when fluid is introduced to, and evacuated from said deicer, said deicer will expand and contract said plurality of expansible and contractible portions.

4,613,103

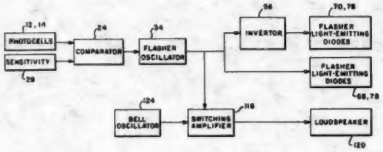
CROSSING BELL AND FLASHER

Benjamin Waranowitz, Chesapeake Beach, Md., assignor to David B. Lellinger, Vienna, Va.

Filed Sep. 28, 1982, Ser. No. 425,254

Int. Cl.[4] B61L *13/04, 29/28*

U.S. Cl. 246—473 A **4 Claims**



1. A train detection and indicating system for a model railroad comprising:

(a) first and second series connected light detecting means adapted for placement in predetermined spaced relationship along the direction of motion of a model train for detecting normal light and a shadow upon passage of a model train;

(b) a power supply and means operative upon connection to said source of power to provide a voltage to said first and second light detecting means;

(c) said light detecting means each being operative to change resistance upon detecting the shadow cast thereon upon passage of the model train;

(d) comparator means having a first input connected to said detecting means and a second input connected to a source of reference voltage; said comparator means being operative to change signal state at the output thereof in response to one of said light detecting means sensing model train shadow, and providing a voltage above said reference voltage;

(e) an oscillator operative upon connection to said comparator means output to emit an output signal at a predetermined desired frequency;

(f) flasher means operative in response to said oscillator output to provide an alternating visible signal.

4,613,104

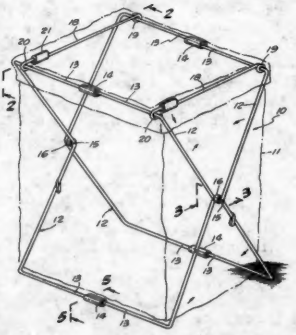
DEMOUNTABLE COLLAPSIBLE TRASH BAG SUPPORT

Isaac Garrott, 1668 E. Alvin Ave., Santa Maria, Calif. 93454

Filed Nov. 7, 1984, Ser. No. 669,011

Int. Cl.[4] B65B *67/12*

U.S. Cl. 248—97 **7 Claims**



1. A folding bag support comprising:

a pair of rectangular wire frames having longer and shorter sides each having similar dogleg portions having a sub-

stantially horizontal portion at the midlength of the two longer sides offsetting an upper and lower portion thereof;

split ring clip means embracing said horizontal portion of the adjacent pairs of said dogleg portions to hold said frames pivotally assembled; and

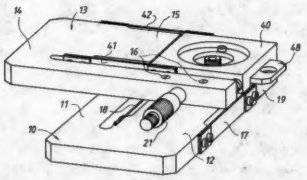
at least one tie member having a first end thereof pivotally connected to a shorter side of one of said frames and the second end thereof detachably engageable with the adjacent shorter side of the other said frames, and said tie member cooperating to hold said frames pivoted apart to provide a rigid support for a bag with the open end thereof overturned about the uppermost pair of the shorter sides of said frames.

4,613,105

DEVICE FOR ALIGNING OPTICAL COMPONENTS

Pierre Genequand, Geneva, and Philippe Schwab, Yverdon, both of Switzerland, assignors to Fondation Suisse pour la Recherche en Microtechnique, Neuchatel, Switzerland

Filed Jan. 25, 1985, Ser. No. 694,859
Claims priority, application France, Feb. 2, 1984, 84 01735
Int. Cl.[4] F16M *11/04*
U.S. Cl. 248—178 **10 Claims**



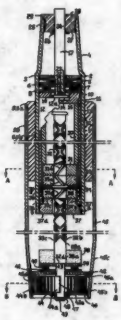
1. A device for aligning a first member such as, for example, an optical component with respect to a second member such as, for example, another optical component, comprising a frame carrying a first support on which said first member is mounted and a second support on which said second member is mounted, as well as means for moving said two supports relatively to each other, said first support being connected to the frame by means of two elongated strips which are flexible in a direction perpendicular to their longitudinal axis and which are arranged parallel to each other, thereby permitting a translational movement of said first support in a first direction, the second support being connected to the frame by means of two elongated strips which are flexible in a direction perpendicular to their longitudinal axis and arranged parallel to each other as to permit a translational movement of said second support in a second direction perpendicular to said first direction, at least one of said two supports comprising means for relative adjustment of two plane contact surfaces of said two members, wherein at least one of said two supports is composed of two elements, one of which carrying the corresponding member and the other one being fixed to the corresponding ends of the flexible elongated strips which connect said support to the frame, these two elements being connected to each other by means of at least three spring strips which are arranged essentially in the contact plane of the two members to be aligned and along three non-coverging directions, thereby forming an assembly which is rigid in said plane but flexible in a direction perpendicular to said plane and which is equivalent to an accomodation membrane permitting contacting of the two closely to each other prepositioned members and the subsequent desired relative positioning by displacement along the contact plane, contact being maintained during the entire process until the two members are fixed permanently with respect to each other.

4,613,106

MECHANICAL ADJUSTABLE COLUMN

Lino E. Tornero, 629 Joyner St., Greensboro, N.C. 27403

Filed Apr. 25, 1985, Ser. No. 727,142
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—405 **19 Claims**



1. A mechanically adjustable support column comprising:

(a) a support tube having a mounting cylinder telescopically mounted in an open end thereof in axially adjustable relation thereto;

(b) a threaded support rod mounted in axially fixed, rotatable relation to said support tube;

(c) an energy storing spring means connecting one end of said support rod with the end of said support tube opposite said open end, whereby energy is stored in said energy storing spring means responsive to rotation of said support rod; and biases said support rod to a first position;

(d) connecting means mounting said mounting cylinder on said threaded support rod in said axially adjustable relation between a first extended position when said support rod is in said first position and a selected second one of a plurality of partially retracted positions wherein said spring means is in an energy storing position, said connecting means comprising:

(i) a first threaded drive nut engaging said threaded support rod and movable axially in response to axial movement of said mounting cylinder whereby axial movement of said mounting cylinder from said extended position is translated into rotation of said support rod through said drive nut;

(ii) a locking means for locking said drive nut at a selected retracted position; and

(e) clutch means operable from outside said mounting cylinder for locking said drive nut in said selected position.

4,613,107

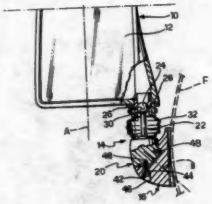
EXTERNAL REARVIEW MIRROR FOR MOTOR VEHICLES, WHICH CAN BE USED SELECTIVELY IN AN UPRIGHT POSITION AND IN A LATERALLY-PROJECTING POSITION

Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Turin, Italy

Filed Oct. 10, 1984, Ser. No. 659,469
Claims priority, application Italy, Mar. 21, 1984, 53160/84[U]
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—481 **8 Claims**

1. An external rearview mirror for motor vehicles, comprising a base for attachment to one side of the vehicle body, a casing with an oblong reflecting sheet having a substantially major axis, and a support arm extending between the base and one side of the casing and incorporating a ball joint, wherein the arm extends from a lower side corner zone of the casing in a direction substantially parallel to the major axis and, at its end

corresponding to the base includes a foot separate from the base and wherein the base and the foot have means for coupling and fixing them together selectively in two positions at 180° to each other with respect to an inclined axis which, when



the base is attached to the body, is located substantially in a vertical transverse plane relative to the direction of movement of the vehicle and is oriented upwardly and outwardly from the side of the body at substantially 45° to the horizontal.

4,613,108

APPLIANCE FOR HANGING OBJECTS ON WALLS

Fred Sundström, Rind 2466, and Kent Sundström, Fanbyn 1445, both of Gällö, Sweden

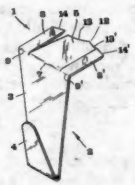
PCT No. PCT/SE84/00184, § 371 Date Jan. 14, 1985, § 102(e) Date Jan. 14, 1985, PCT Pub. No. WO84/04661, PCT Pub. Date Dec. 6, 1984

PCT Filed May 16, 1984, Ser. No. 694,673

Claims priority, application Sweden, Jun. 2, 1983, 8303114

Int. Cl.⁴ A47G *1/16*

U.S. Cl. 248—497 **4 Claims**



1. An applicance for hanging objects, such as pictures, on walls, especially gypsum wall boards, comprising a fixing part insertable in the wall and comprising an extremely thin plate adapted to be driven into the wall with its plane lying substantially horizontally; a suspension part adapted to function as a hook with its plane lying substantially vertically which is accessible from outside the wall and is adapted to receive the object to be suspended, and two tongues, one on each side of said thin plate, each of which tongues are narrower than said plate and are structured to be driven into the wall concurrently with the plate but at an angle which slightly deviates from the angle at which the plate is driven in, said tongues constituting a means for counteracting unintentional extraction of the plate from the wall after the appliance has been fixed thereto, said thin plate and said tongues, in the unactuated state prior to insertion in the wall, forming a small angle with each other, which diverges in the direction of the free ends of the plate and the tongues.

4,613,109

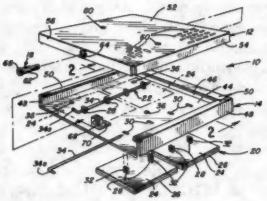
APPLIANCE SECURITY DEVICE

William L. Boscacci, San Leandro, Calif., assignor to Lucasey Manufacturing Company, Oakland, Calif.

Filed Mar. 19, 1984, Ser. No. 591,012

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—553 **21 Claims**



14. A security device for mounting an appliance on a support surface comprising:

a base section having associated first securing means for securing said base section to said support surface;

a cover section having associated second securing means for securing said appliance to said cover section;

interengaging means between said first securing means and said base section for releasably securing said base section to said first securing means;

a complementary interengaging slide housing formed by said base section and said cover section with said cover section manually slidable in a direction generally parallel to said support surface, said slide housing defining a closed compartment having controlled accessibility thereto and further enclosing and concealing said interengaging means and second securing means in said compartment; and

lock means for releasably joining said base and cover sections when fully engaged to form said closed compartment with the joining of said base and cover sections creating limited access to release said cover section from said base section.

4,613,110

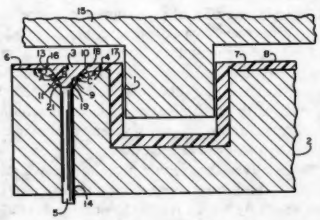
APPARATUS FOR VENTING OF DIES IN MOLDING OF THERMOSET PLASTIC COMPOUNDS

Robert H. Rose, 13850 Forest Grove Rd., Brookfield, Wis. 53005

Continuation-in-part of Ser. No. 501,645, Jun. 6, 1983, Pat. No. 4,562,990. This application Oct. 3, 1983, Ser. No. 537,168

Int. Cl.⁴ B29C *33/10*

U.S. Cl. 249—141 **3 Claims**



1. Apparatus for venting of die in molding of thermoset molding compounds, said apparatus comprising a die vent system consisting of vent path extending to vent well and vent opening from said vent well to atmosphere, and said vent well is connected to a molding die by means of said vent path having a taper of 4° tapering outwardly from said die to said vent

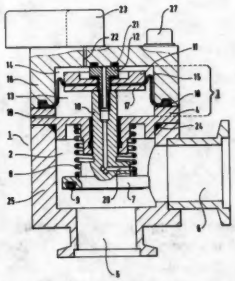
well exhausting into said vent opening to the atmosphere whereby molding compound fills said die vent system.

4,613,111

VALVE WHICH IS OPENED BY REDUCED PRESSURE

Jean-Marc Paquet, and René Sibuet, both of Annecy, France, assignors to Cit-Alcatel Compagnie Industrielle des Telecommunications

Filed Dec. 19, 1984, Ser. No. 683,543
Claims priority, application France, Dec. 22, 1983, 83 20576
Int. Cl.⁴ F16K *51/02*
U.S. Cl. 251—46 **4 Claims**



1. A valve which opens on reduced pressure, said valve comprising:

a hollow body;

an internal partition dividing said hollow body into first and second portions;

a first opening within said hollow body first portion for connection to an enclosure to be evacuated, and

a second opening within said hollow body first portion for connection to the aspiration side of a vacuum pump;

a moving valve plate disposed inside the hollow body first portion;

a spring operatively engaging said valve plate for urging said valve plate in a direction to close the first opening;

a rod having one end connected to the valve plate and slidably, sealably passing through the internal partition;

a piston connected to the other end of said rod within said hollow body second portion for dividing the second hollow body portion into a first chamber and a second chamber which are sealed from each other, the first chamber being on the rod side of the piston,

means for placing said first chamber in communication with the outside, an orifice within said hollow body for communicating said second chamber with the outside,

closure means for said orifice, and

means for placing said second chamber in communication with the first portion of the hollow body.

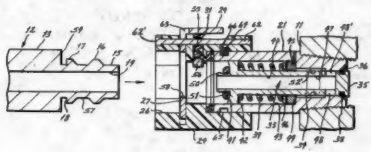
4,613,112

QUICK-DISCONNECT FITTING FOR GAS LINE CONNECTION

James R. Phlipot, and Randolph E. Scharfenberg, both of St. Louis, Mo., assignors to Essex Industries, Inc., St. Louis, Mo.

Filed Jul. 19, 1985, Ser. No. 756,709
Int. Cl.⁴ F16L *37/08*
U.S. Cl. 251—149.6 **13 Claims**

1. A quick-disconnect fitting of fail-safe character for quick connection or disconnection of a gas line, such as an oxygen line, and adapted for receiving a gas line plug of the type having a plug flange, thereby to provide gas to a line terminated by the plug, characterized by the fitting comprising a metal valve body having an inner end externally threaded for being threadably received by corresponding structure of a source of gas under pressure and an outer end to which is secured in non-threaded engagement a cap having a receptacle for receiving the gas line plug, the valve body including a plunger-type valve axially contained internally within the valve body in protected relationship, the valve body being shiftable within the valve body between open and closed positions, the valve carrying at its inner end seal means for sealing engagement with the valve body when the valve is closed, a compression spring surrounding the valve for urging it into close position, the plug including a nose for engaging and maintaining open the valve when the plug is received within the cap for receiving gas from the source, the cap carrying



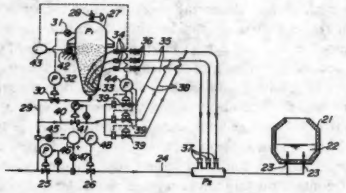
locking means for selective locking engagement with the plug flange when the plug is received by the cap, the cap receptacle being laterally cross-sectionally configured for unique mutual engagement of the plug to prevent improper connection thereof, the cap being of molded synthetic resin material, and means for securing the cap about the periphery of only the outer end of the valve body, whereby if the cap is broken away from the valve body, the valve will remain within the valve body in closed, protected condition without permitting escape of gas from the source through the fitting.

4,613,113

APPARATUS FOR BLOWING POWDERY REFINING AGENT INTO REFINING VESSEL

Sadayuki Saito; Shunji Hamada; Tadaaki Iwamura, and Ryoji Takabe, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 563,448, Dec. 20, 1983, abandoned.
This application Feb. 21, 1985, Ser. No. 703,461
Claims priority, application Japan, Dec. 22, 1982, 57-225649
Int. Cl.⁴ C21B *5/02*
U.S. Cl. 266—83 **3 Claims**



1. An apparatus for blowing a powdery refining agent into a refining vessel by feeding the powder from a pressure vessel pressurized with a refining gas to a main pipe for the supply of the refining gas and blowing it into a molten metal bath of the refining vessel which comprises a plurality of transportation pipes directly connecting said pressure vessel to said main pipe, an on-off valve arranged in each of said transportation pipes, a plurality of secondary gas pipes for the introduction of the refining gas supplied by said main pipe, said plurality of secondary gas pipes being connected to said transportation pipes downstream of said on-off valves, respectively, a variable flow control valve arranged in each of said secondary gas pipes, and means responsive to rate of flow of powder discharged from said pressure vessel for adjusting each of said variable flow control valves to obtain desired gas-powder mixture flowing in said transportation pipes, whereby the rate of flow of the

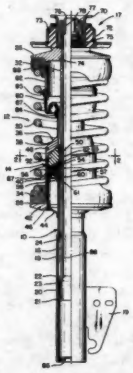
powder discharged from the pressure vessel is controlled only by the opening degree of each of said flow control valves.

4,613,114

SUSPENSION STRUT

H. Neil Paton, 2521 W. Montlake Pl. East, Seattle, Wash. 98112

Filed Mar. 8, 1984, Ser. No. 587,520
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—9 R **9 Claims**



1. A suspension strut, comprising: a telescoping load bearing assembly including two outer ends, one of said outer ends including first spring support means; damping means for frictionally damping telescopic movement of said load bearing assembly in response to said strut being subjected to an axial load, said damping means including friction shoe means engageable with said load bearing assembly and a carrier movable with respect to said load bearing assembly and to said friction shoe means, said carrier having two ends, one of which includes second spring support means, and the other end of which is engaged with said friction shoe means at a region of contact on said friction shoe means, said carrier being of sufficient length that said second spring support means is spaced from said first spring support means by a distance greater than the distance between said first spring support means and said region of contact on said friction shoe means; and

load bearing spring means for providing the sole source of resilient load bearing support of said load bearing assembly and for simultaneously providing a force operating said friction shoe means, said spring means having opposite ends supported by said first and second spring support means and urging said carrier away from said first spring support means and toward the other outer end of said load bearing assembly when said strut is subjected to an axial load;

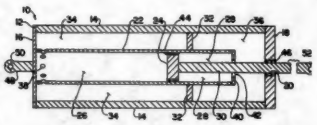
wherein said load bearing assembly extends through said damping and said spring means, said damping means is interposed between said spring means and said load bearing assembly, and said carrier causes said friction shoe means to engage with said load bearing assembly as said carrier is urged away from said first spring support means toward the other outer end of said load bearing assembly by said spring means.

4,613,115

TEMPERATURE COMPENSATED GAS SPRING

Richard C. Smith, Pittsburgh, Pa., assignor to Gas Spring Company, Division of Fichtel & Sachs Industries, Inc., Colmar, Pa.

Continuation of Ser. No. 413,241, Aug. 30, 1982, abandoned.
This application Apr. 4, 1985, Ser. No. 719,633
Int. Cl.[4] F16F *9/06*
U.S. Cl. 267—64.25 **31 Claims**



1. A temperature-compensated gas spring, comprising:

a self-contained casing having a closed end wall and an apertured end wall;

a piston rod extending from the interior to the exterior of said casing through said apertured end wall in sealed relation thereto;

a piston mounted on the piston rod within the casing and dividing the interior of said casing into first and second sealed chambers adjacent said closed end wall and said apertured end wall, respectively, of said casing;

a primary pressure source in said first chamber creating a primary pressure acting against the piston to urge the piston rod out of the casing;

a secondary pressure source in said second chamber creating a secondary pressure acting against the piston to urge the piston rod into the casing;

the magnitudes of said primary and secondary pressures relative to the respective piston areas on which they act being such that a new outward force is exerted on the piston rod;

the primary pressure source comprising a pressurized gas characterized by (1) a first percent change of pressure with temperature and (2) a change of pressure with volume such that said net outward force varies with piston rod displacement;

the secondary pressure source comprising a two-phase vapor-liquid system having a vapor pressure characterized by a second percent change in pressure with temperature at temperatures below the critical temperature of said system;

the second percent change of pressure with temperature being greater than the first percent change of pressure with temperature; and

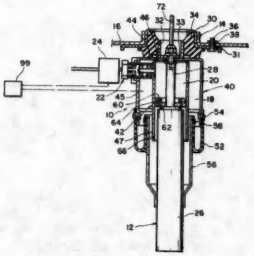
the volume of said second chamber and the mass of said two-phase system in said second chamber being such that (1) the two-phase system does not fully condense into liquid at any point over the operating temperature range of the gas spring and at any point over the working stroke of the piston rod and (2) the liquid phase and the vapor phase of said two-phase system remain in equilibrium over at least a substantial portion of the temperature range over which temperature compensation is to be effected and over at least a portion of the working stroke of the piston rod, whereby the effect of temperature on the net outward force exerted on the piston rod is compensated for over part or all of the working stroke of the piston rod.

4,613,116

AIR SUSPENSION

Shuuichi Buma, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 28, 1984, Ser. No. 675,847
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—64.25 7 Claims



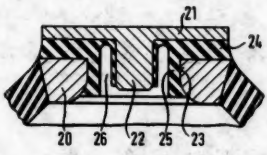
1. An air suspension comprising:
a shock absorber provided with a cylinder and a piston rod;
first and second air chambers formed to surround the shock absorber, the first air chamber being formed of a first housing and a diaphragm, the second air chamber being formed of a second housing and a fixed piston which is provided with an orifice for affording communication between said first and second air chambers;
a valve capable of affording and shutting off communication between the first and second air chambers; and
a means for operating the valve,
wherein said first and second air chambers act as springs arranged in parallel under the shut-off condition.

4,613,117

ENGINE BEARING WHICH HAS HYDRAULIC DAMPING

Rainer Andrä , Limburg, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 4, 1984, Ser. No. 657,737
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336204
Int. Cl.[4] F16F *9/08*
U.S. Cl. 267—140.1 3 Claims



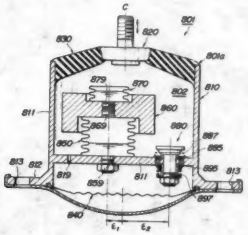
1. Engine bearing with hydraulic damping for supporting mounting elements, comprising at least one liquidfilled chamber having a substantially conical peripheral wall, said peripheral wall being formed of rubber-elastic material forming a bearing spring, a bearing plate closing a front face of said chamber, said bearing plate being annular defining an open recess therein with a given diameter, and a thrust element with adjustable radial rigidity vulcanized to said bearing plate for supporting the mounting elements, said thrust element including a cylindrical mounting plate having a cylindrical lug with a diameter smaller than said given diameter projecting into said inner recess and into said chamber, and an elastomer layer disposed between said lug and said bearing plate in said inner recess, vulcanizing said lug to said bearing plate.

4,613,118

FLUID-SEALED ENGINE MOUNTING

Isamu Morita, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,153
Claims priority, application Japan, Feb. 17, 1983, 58-25320; Feb. 17, 1983, 58-25321; Feb. 17, 1983, 58-25322; Feb. 17, 1983, 58-25323; Feb. 17, 1983, 58-25324
Int. Cl.[4] F16F *9/08*
U.S. Cl. 267—140.1 12 Claims



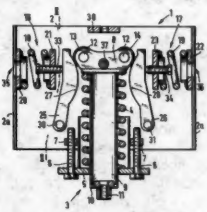
1. A fluid-sealed engine mounting for mounting an engine on a vehicle frame, comprising:
(a) a connector adapted to be connected to the engine;
(b) a base adapted to be connected to the vehicle frame;
(c) an elastic member jointing said connector and said base to each other;
(d) said connector, said base and said elastic member jointly defining a fluid chamber in which a fluid is sealed; and
(e) a first variable-volume member mounted on one of said connector and said base in said fluid chamber and containing a gas and a liquid sealed therein, said first variable-volume member being expandable and contractable in a direction in which vibrations are transmitted in said fluid chamber.

4,613,119

SUSPENSION DEVICE WITH A COMPENSATORY SPRING SYSTEM

Hans-Herlof Hardtke, Zeven, Fed. Rep. of Germany, assignor to LISEGA Kraftwerkstechnik GmbH, Fed. Rep. of Germany

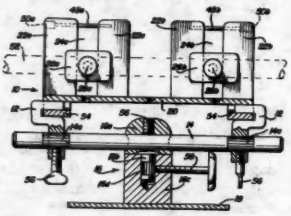
Filed Aug. 5, 1985, Ser. No. 762,288
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501853
Int. Cl.[4] F16F *1/2;* F16L *3/16*
U.S. Cl. 267—172 20 Claims



1. A suspension device for suspendingly supporting loads under a generally constant spring-biasing support force comprising two relatively movable portions, a first of said portions being adapted to be secured to a support and a second of said

portions being adapted to be secured to a load to be suspendingly supported thereby, main biasing means for biasingly mounting said first and second portions relative to each other, compensatory spring means for compensating for variations in tension and/or compression forces of said main biasing means, said compensatory spring means including at least one spring mounted between said first and second portions, a lever, means for mounting said lever for pivoting movement relative to and between said one spring and said second portion, and cooperatively engagable cam and cam follower means carried by said lever and said second portion for compensating the tension and/or compression forces of said main biasing means dependent upon the load secured to the second portion and, thus, the relative position of the cam follower means upon the cam means.

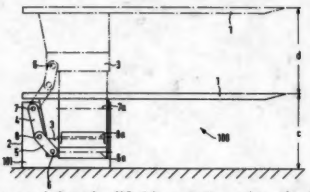
4,613,120
D-CLAMP VISE
John J. Kozar, 5th & 11th, New Kensington, Pa. 15068
Filed May 28, 1985, Ser. No. 738,673
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—71 **14 Claims**



1. A workpiece holding device comprising a channel-section frame having a base portion and pairs of web segments extending from opposite sides of the base portion, the respective pairs of web segments each defining a slot therebetween extending direction-wise from toward the base portion to toward the free ends of the respective segments, a first slide fitting for floating receipt in the slot between a pair of web segments on one side of the base portion, the first slide fitting carrying a lead screw threaded therethrough, the lead screw having an inner end formed with a clamp member for clamping against a workpiece located adjacent the web segments on the other side of the base portion responsive to tightening of the lead screw, and a second slide fitting for sliding receipt in the slot between the web segments on the other side of the base portion, the second slide fitting comprising a jaw member and means for releasably clamping the jaw member in selected position along the slot.

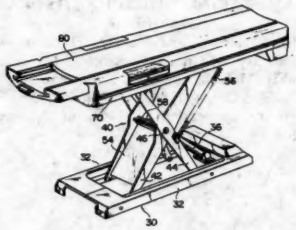
4,613,121
X-RAY EXAMINATION TABLE
Alfred Hahn, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Nov. 9, 1984, Ser. No. 669,802
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345434
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—322 **3 Claims**

1. In an x-ray examination table comprising a trestle on which a patient support platform is mounted for height adjustability, the improvements comprising the trestle including a base and a liftable member, said platform being mounted on the liftable member, said trestle including height adjustment means for lifting the liftable member between a lowermost position and a raised uppermost position relative to the base and guide means for guiding the liftable member as it is moved between said positions, said guide means including two first shafts mounted on the liftable member in a horizontal plane and extending perpendicularly to each other, a separate linkage arrangement pivotally connected to each of said first shafts and including a first bracket arm secured to the first shaft for pivoting thereon, a second bracket arm pivotally connected to the first bracket arm by a second shaft extending parallel to the first shaft and said second bracket arm being pivotally connected to the base by a third shaft extending parallel to the first and second shafts, said base including an open box-like member



telescopically receiving the liftable member when the liftable member is in the lowermost position, said first shafts of the liftable member being substantially below the level of the second and third shafts when the liftable member and table are in the lowermost position and with the liftable member in the uppermost position, the liftable member being raised completely out of the base with the first shafts being disposed above the second and third shafts of each of the linkage arrangements.

4,613,122
CT COUCH APPARATUS HAVING A LIFT
Yoshinori Manabe, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 16, 1984, Ser. No. 641,575
Claims priority, application Japan, Aug. 19, 1983, 58-150191
Int. Cl.[4] A61B *6/02*
U.S. Cl. 269—322 **12 Claims**



1. A CT couch apparatus for lifting a patient from an initial patient-placing position, through an intermediate position, to a final position aligned with the opening of a scan gantry comprising:

a base having at least one base rail;

a couch on which the patient is to be laid;

a mounting frame for slidably supporting said couch so it can advance into and retreat from the opening of the scan gantry, said mounting frame having at least one frame rail;

an arm structure for supporting said mounting frame relative to said base, said arm structure including at least a first arm and a second arm, said arms being pivotally fixed to each other at their mid portions to form the shape of an X;

first, second and third movement fulcrums;

said first arm being pivotally fixed at its lower end to said base and being pivotally fixed at its upper end to the first movement fulcrum, said first movement fulcrum being slidable along said frame rail;

said second arm being pivotally fixed at its upper end to the

second movement fulcrum and being pivotally fixed at its lower end to the third movement fulcrum, said second movement fulcrum being slidable along said frame rail and said third movement fulcrum being slidable along said base rail;

means for pivoting said arms in the direction that lifts their upper ends and said mounting frame relative to said base;

first stopper means for preventing the first movement fulcrum from sliding along said frame rail in a first direction beyond a preselected position;

second stopper means for preventing the second movement fulcrum from sliding along said base rail in the first direction beyond a preselected position;

a resilient means for urging said first movement fulcrum toward engagement with said first stopper means; and

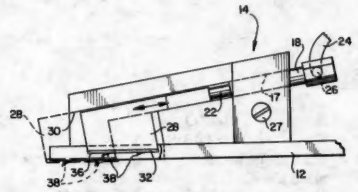
said first and second stopper means being positioned so that the first stopper means contacts said first movement fulcrum when the mounting frame is located between the patient-placing position and the intermediate position and the second stopper means contacts the second movement fulcrum when the mounting frame is located between the intermediate position and the final position.

4,613,123

MATERIAL HANDLING DEVICE

Franke, Sr., John, Glendale, Calif., assignor to The Singer Company, Stamford, Conn. and AVG Productions, Inc., Valencia, Calif.

Filed May 18, 1984, Ser. No. 611,692
Int. Cl.[4] B65H *3/22*
U.S. Cl. 271—18.3 **5 Claims**



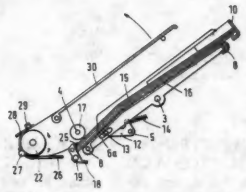
1. A device for moving flexible materials, said device including a base member formed with a substantially planar surface adapted to be shifted into and out of engagement with the flexible material to be moved, said base member surface formed with an aperture, a carrier member, a substantially planar pick-up accommodating surface formed on said carrier member, a pick-up element formed with a substantially straight shank and at least one sharp pointed projection extending laterally a predetermined distance from said shank, said pick-up element shank fixedly secured on and parallel to the pick-up accommodating surface of the carrier member with said sharp pointed projection extending outwardly from the pick-up accommodating surface, means shiftably supporting the carrier member relative to the base member to move said at least one pick-up element projection through the base member aperture while maintaining the pick-up element accommodating surface and the pick-up element shank secured thereon substantially parallel to the material engaging surface of the base member.

4,613,124

SINGLE SHEET FEEDING

Gerhard Lohrmann, Elchingen, and Kurt Roehrer, Niederstotzingen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,360
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3247341
Int. Cl.[4] B65H *3/42*
U.S. Cl. 271—16 **6 Claims**



1. Apparatus for single sheet feeding in a printer comprising:

two flat bar elements movably arranged and provided for holding a stack of sheets, the motion permitting raising and, lowering the stack of sheets, there being a topmost sheet accordingly;

two sheet-separating rollers disposed respectively adjacent said flat bar elements;

a rocking frame being comprised of side sheets and spacer rods and including said flat, stack-bottom defining bar elements, there being a shaft on which said rocking frame is pivotably journaled;

means for reversibly driving said rollers in unison;

two holddown fingers arranged respectively laterally displaced from the separating rollers and from the bar elements near two corners of the stack, for particularly holding down said stack including said topmost sheet, the separating rollers being provided at a somewhat higher level than said holddown fingers, said fingers being laterally displaced from said separating rollers so that the latter still engage the top sheet even though the fingers hold the stack including the top sheet down further;

the reversibly driven separating rollers pulling the topmost sheet first out from under said fingers and upon reversing direction the rollers slide the sheet over said fingers; and

a printing platen drum with associated transport rolls and guide elements disposed for engaging a sheet that has been moved by said separating rollers over said holddown fingers.

4,613,125

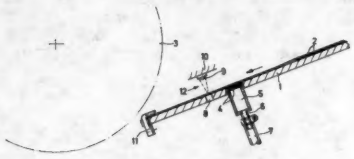
METHOD AND DEVICE FOR FEEDING SHEETS IN REGISTER IN A SHEET-PROCESSING MACHINE

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,654
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301722
Int. Cl.[4] B65H *7/02*
U.S. Cl. 271—227 **7 Claims**

1. Method of feeding sheets in register in a sheet-processing machine wherein the sheets are displaced with the aid of an optoelectronic scanning device and an alignment device in a given direction in the machine perpendicularly to an edge of each sheet which is to be aligned, which comprises so displacing the sheets that the edge of the sheet passes and covers a measuring zone of a scanning device, gripping the sheet with the alignment device and applying an alignment displacement thereto so that the sheet covering the measuring zone clears the measuring zone of the scanning device again; generating a signal in response to clearance of the scanning device by the

sheet edge and, in response to the generated signal, further displacing the sheet a given ever-constant distance from the



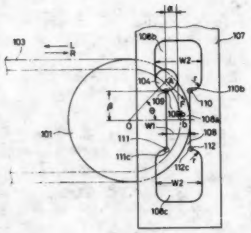
measuring zone of the scanning device to a position wherein the respective sheets are in register.

4,613,126

CHAIN DRIVE TYPE CARRIAGE RECIPROCATING DEVICE FOR A COPYING MACHINE

Tamami Handa, Nara, and Eiichi Shimizu, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1984, Ser. No. 684,343
Claims priority, application Japan, Dec. 27, 1983, 58-249974
Int. Cl.[4] B65H *5/04*
U.S. Cl. 271—267 **4 Claims**



1. A device for reciprocating a document table of a copying machine, comprising:

a plate means secured to said document table, said plate means having a substantially dumb bell shaped opening comprising two rounded edged rectangular sections joined by a bridging section;

a pair of sprockets located near the ends of a reciprocal path of said plate;

a chain engaged for movement around said sprockets; and

roller means, coupled to said chain and extending through said dumb bell shaped opening of said plate means for utilizing the movement of said chain to reciprocate said plate means whereby upon manual reciprocation of said document table, said roller means becomes engaged with a surface of said rounded edge rectangular sections.

4,613,127

AUTOMATIC RETARD ADJUSTMENT MECHANISM FOR SHEET FEEDING

Scott A. Wishart, Waterloo; Tadeusz Pecak, Kitchener; Owen H. Wilson, Breslau, and Anthony J. Boon, Kitchener, all of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 23, 1985, Ser. No. 768,763
Int. Cl.[4] B65H *5/06*
U.S. Cl. 271—274 **15 Claims**

1. Sheet feeding apparatus comprising, in combination:

a base including a sheet feed station;

sheet driving means positioned on one side of said sheet feed station and rotatable in one direction for driving a first sheet;

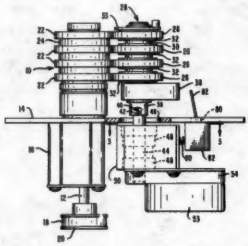
sheet retarding means positioned on the opposite side of said sheet feed station in operative relation to said driving means and rotatable in the same direction as said sheet driving means for retarding the movement of a further sheet which might otherwise be driven with said first sheet;

mounting means pivotally mounted on said base and carrying said sheet retarding means thereon;

support means secured to said base;

biasing means supported by the support means and engageable with the mounting means;

spring means extending between the biasing means and the support means and urging the biasing means into engagement with the mounting means;



retaining means coupled to the support means and the biasing means and movable between a first position in which the biasing means is free to move in a first direction into engagement with the mounting means and is retained against movement in an opposite direction, and a second position in which the biasing means is free to move in said opposite direction; and

resilient means operatively associated with said mounting means and engageable with said biasing means to permit limited movement of said mounting means and the retarding means mounted thereon in a direction away from the sheet driving means.

4,613,128

3D DISPLAY

Richard J. Lasky, Wanaque, N.J., assignor to Trans-World Manufacturing Corp., E. Rutherford, N.J.

Filed Jan. 29, 1985, Ser. No. 696,016
Int. Cl.[4] A47F *11/06*
U.S. Cl. 272—8 M **8 Claims**

1. A display device, comprising:

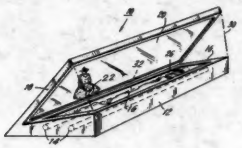
a generally planar light transmitting surface having both a background and an intermediate image located thereat, said intermediate image being in focus, said background image being out of focus;

a generally planar mirror having a foreground image located thereat;

first means for projecting light through said background and intermediate images onto said mirror for reflection thereby; and

second means for maintaining said light transmitting surface at an acute angle with respect to said mirror such that said light transmitting surface may be viewed by looking at said mirror along an axis which is within said acute angle whereby said background, said foreground and said intermediate images are superimposed on each when viewed along said axis to create the illusion that said intermediate

image is located behind said foreground image and said background image is located behind both said foreground



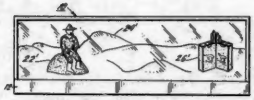


image and said intermediate image, thereby creating a three dimensional scene.

4,613,129

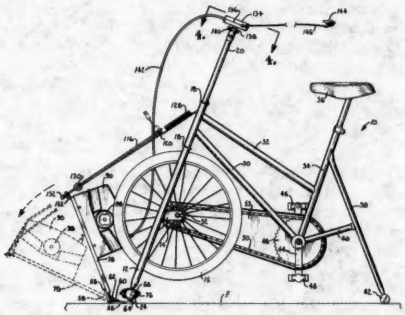
EXERCISE BICYCLE ATTACHMENT

Charles H. Schroeder, 10408 E. 64th St., Raytown, Mo. 64133, and Larry Farnham, 905 N. 39th, Blue Springs, Mo. 64015

Filed Nov. 9, 1984, Ser. No. 670,286

Int. Cl.[4] A63B *69/16*

U.S. Cl. 272—73 **15 Claims**



1. An attachment for a stationary exercise bicycle having a frame for supporting the bicycle on the floor, a rotatable wheel and pedals for turning the wheel when the bicycle is pedaled, said attachment comprising:

a floor plate resting on the floor;

means for connecting the bicycle frame to said floor plate at a location adjacent the bicycle wheel;

an alternator having a drive shaft for driving of the alternator when turned;

a drive wheel mounted on said drive shaft;

hinge means for connecting said alternator with said floor plate in a manner permitting the alternator to be raised and lowered about a generally horizontal hinge axis between an operating position wherein said drive wheel is engaged against the bicycle wheel to be driven thereby and a release position wherein the alternator rests on the floor with the drive wheel released from the bicycle wheel; and

releasable means for holding said alternator in the operating position,

whereby the alternator can be adjusted to vary the load applied by said drive wheel to the bicycle wheel.

4,613,130

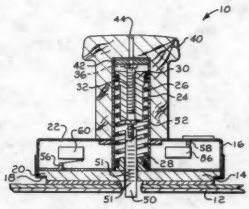
RESILIENT THERAPEUTIC DEVICE WITH TIMER AND INDICATOR

Harold K. Watson, 600 Wolcott Hill Rd., Wethersfield, Conn. 06109

Filed Jul. 16, 1985, Ser. No. 755,565

Int. Cl.[4] A63B *21/02*

U.S. Cl. 272—135 **5 Claims**



1. An exercise device for use in dystrophy therapy comprising:

a platform having a base adapted to be placed on a horizontal surface and a cover vertically displaceable relative to the base and forming in cooperationg with said base a housing with said cover defining a generally horizonally extending upper surface;

handle means mounted in fixed relationship to said cover and extending generally vertically therefrom to upwardly terminate in an application surface to facilitate application of a downward force through a hand forced against said application surface, said application surface having an area which is substantially less than the area of the upper surface of said cover;

compression spring means enclosed in said formed housing and said handle means and having opposing biasing ends to provide a variable resistance force to a force of compression exerted between said opposing ends, one said end being seated against a first seat mounted in pre-established relationship with said base, the other said end being seated against a second seat mounted in pre-established relationship with said handle means;

one said seat being a variably positionable seat to adjustably vary the resistance force of said compression spring means;

adjustment means to selectively pre-set the position of said adjustable seat;

timer means to record cumulative elapsed time and present a visual display thereof at said cover upper surface; and

switch means enclosed in said formed housing to activate said timer means when a compressive force applied at said application surface and exerted between said handle means and base exceeds said pre-set resistance force and to deactivate said timer means when said compressive force does not exceed said pre-set resistance force.

4,613,131

EXERCISE DEVICE FOR PHYSICAL THERAPY

Erma N. Anderson, 21025 Victor St., Apt. 7, Torrance, Calif. 90503

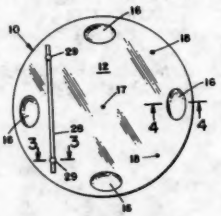
Continuation-in-part of Ser. No. 458,743, Mar. 2, 1983, abandoned. This application Nov. 26, 1985, Ser. No. 801,830

Int. Cl.[4] A63B *23/04*; A63G *11/00*; A63H *1/16*

U.S. Cl. 272—146 **5 Claims**

1. An exercise device comprising a one-piece rigid foam

element, said element being lighter in weight than its own volume of water, having a substantially continuous skin, having a first surface shaped as a symmetric oblate spheroid segment, having a second substantially flat circular surface merged smoothly into said first surface around its circumfer-



ence, said second surface including four, shallow indentations for positioning the hands and feet of a user spaced closely to its perimeter with one indentation in each quadrant, and at least two anchor means that do not protrude above said substantially flat surface, said first and second surfaces being free from abrupt contour features.

4,613,132

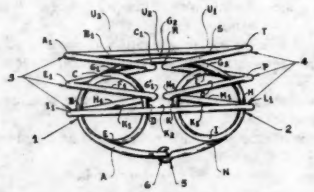
LOOP PUZZLE

Kim L. Vinh, 3228 Harrisburg Pike, Landisville, Pa. 17538

Continuation-in-part of Ser. No. 665,964, Oct. 30, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,502

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—158 **7 Claims**



1. In a puzzle of the type described having an openable loop with two internal subloops in the form of single turn coils spiraling continuously into each other through semi-oval non-flat curves, and a closed loop with two internal subloops in the form of double turn coils spiraling continuously into each other through semi-oval flat curves, said openable loop being formed with a hook and an eye as means for putting said loops in a predetermined interengaged position and for quick disengagement of said loops independently of a solution of said puzzle, said predetermined interengaged position comprising each said single turn coil within a respective one of said double turn coils and the interengagement of said hook and eye so that disengagement of said loops can only be done by a series of prescribed manipulations.

4,613,133

GOLF PRACTICE DRIVING DEVICE

Roberto B. O. Selberg, Täby; Hakan Kronogard, Lund, and John Cockin, Nacka, all of Sweden, assignors to M.A. Golf Training International AB, Malmö , Sweden

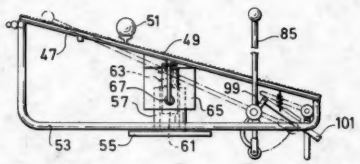
PCT No. PCT/SE83/00295, § 371 Date Apr. 19, 1984, § 102(e) Date Apr. 19, 1984, PCT Pub. No. WO84/00696, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 23, 1983, Ser. No. 604,625

Claims priority, application Sweden, Aug. 23, 1982, 8201133

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—195 B **6 Claims**



1. A golf practice device comprising:

a platform having an upper surface covered with a carpet, the platform being adjustable to be inclined in any direction in order to simulate play in an upward slope, downward slope or slope in the lateral directions;

a bearing support connected to said platform, the platform being rotatably arranged relative said bearing support for rotation relative thereto around a vertical axis;

a frame, the platform being supported by said frame surrounding the platform at a rim portion thereof in order to impart stability to the platform and to support the platform on the ground;

a lifting device for lifting the platform from the ground and relative the bearing support, so that the platform, when the lifting device is activated, may be raised from the ground to be freely rotatable in any direction around said vertical axis, and the platform, when the lifting device is deactivated, may be lowered to be firmly supported on the ground and thus be non-rotatable; and a locking device for locking the platform in said raised position while allowing free rotation of the platform in said raised position.

4,613,134

METHOD OF PLAYING A BOARD GAME UTILIZING A BOARD WITH DIFFERENT ZONES

Gerard J. Tobin, 12 Birchwood Rd., Enfield, Conn. 06095

Division of Ser. No. 595,317, Mar. 30, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,835

Int. Cl.[4] A63F *3/02*

U.S. Cl. 273—242 **10 Claims**

1. A method for playing a game on a board having a flat surface on which is delineated a grid defining a plurality of contiguous spaces grouped by boundaries into a plurality of differentiated zones including home zones at opposite ends of the grid, side zones at opposite sides of the grid extending between the home zones, a playing zone surrounded by the home zones and side zones, and a safety zone surrounded by the playing zone, the game further including a set of movable pieces for each player, each piece having a value attribute, wherein the method of play comprises:

each player initially positioning his pieces in one of the home zones;

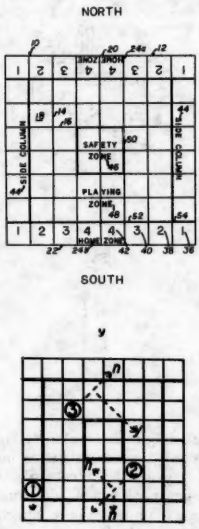
each player alternating turns by moving one of his pieces, the movement of the piece being such that the piece moved must be moved the number of spaces indicated by the value attribute associated with that piece, the player's object being to land, by exact count on a space in another player's home zone;

the movement of each piece including the feature that when a piece lands in exact count on a space occupied by an-

other player's piece, said other player's piece is captured and removed from the game, except that when in the safety zone, a piece may not be captured;

the movement of pieces having a value greater than a predetermined minimum value being restricted so that

(a) while in the playing zone the piece must move diagonally in one continuous direction, but if the piece thereby bumps the safety zone or the player's own home zone boundary the piece must rebound from the



boundary at an equal angle in order to remain in the playing zone,

(b) while in a side zone the piece must move toward one of the home zones in order to remain in the side zone; and

the players determining the winner at the end of the game by the highest point score wherein points are awarded in relation to the number and value of a player's own pieces that reach another player's home zone and the number and value of another player's captured pieces.

4,613,135

QUICK CHANGE DEVICE FOR A BASKETBALL GOAL

Richard R. Rush, 907 S. Vandalia, Tulsa, Okla. 74112

Filed Jan. 3, 1986, Ser. No. 815,900

Int. Cl.[4] A63B *63/08*

U.S. Cl. 273—1.5 R **12 Claims**

1. A quick change device for holding a basketball goal comprising:

a receptacle member securable to a basketball backboard including

a back plate having a stop bolt secured normally thereto, and

a pair of guide members positioned on the back plate to form a guide channel on a front portion of the receptacle member, and

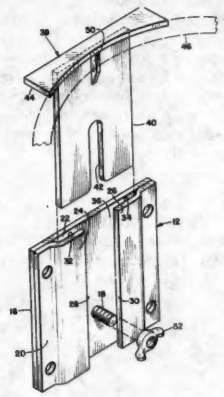
a goal-mounting member including

a tongue having a longitudinal slot slightly wider than the stop bolt and extending inwardly from a first end,

a spacer member secured normally to the tongue at a second end thereof,

a goal ring secured to the spacer member,

wherein the goal-mounting member and the receptacle member are cooperable in a manner that the tongue can slide into the guide channel, the slot can receive the stop



bolt, and a nut is securable on the stop bolt to secure the tongue between the nut and the back plate.

4,613,136

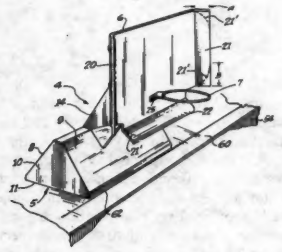
POOL SIDE HOOP GAME BACKBOARD

John B. Raba, 2901 NE. 1 Ave., Pompano Beach, Fla. 33064, and Art Graham, 2824 S. Edgehill La., Cooper City, Fla. 33026

Filed Aug. 20, 1985, Ser. No. 767,626

Int. Cl.[4] A63B *63/08*

U.S. Cl. 273—1.5 R **4 Claims**



1. A poolside hoop game device comprising:

a truncated substantially pyramidal-shaped elongated hollow lightweight support base having top and bottom planar surfaces and converging front and rear planar faces;

a pair of spaced support members secured to said top surface of said base and extending a short distance forwardly of said front face at an angle of inclination substantially the same as the angle of inclination of said rear face;

a vertical plate secured to said supports;

a vertical planar backboard adjusably connected to said plate and superimposed thereon;

said plate and said backboard including means for varying the height of said backboard relative to a side of a pool;

said planar backboard surface including first and second rebound wings connected along opposite edges of the backboard surface and extending vertically along the edges, said planar backboard surface further including a third rebound wing extending along a lower edge of the backboard surface, said wings being adjustably secured to

said backboard surface for providing an angle of about 45 degrees with respect to the planar background surfaces; and

a circular hoop connected to said planar backboard surface and being positioned at a right angle with respect to said backboard surface;

said third rebound wing extending along a lower edge of the backboard surface at a point immediately below the connection of the hoop to the backboard surface;

said support base being so constructed and of sufficient stability for solely maintaining said device in an upright position during use thereof.

4,613,137

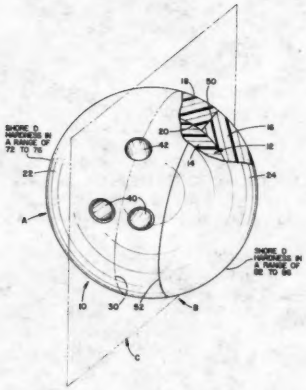
BOWLING BALL

Carl A. Ruckert, 1600 Edmar La., St. Louis, Mo. 63138

Filed Mar. 11, 1985, Ser. No. 710,548

Int. Cl.[4] A63B *37/14*

U.S. Cl. 273—63 R **11 Claims**



8. A bowling ball for impacting tenpins on a bowling lane having a smooth spherical outer surface including first and second distinct sections, said first section comprised of a first material of uniform composition having a Short D hardness reading greater than 80 and defining a first portion of said spherical outer surface, said second section comprised of a second material of uniform composition having a Short D surface hardness less than said first material and defining a second portion of said outer surface, which second portion includes at least a surface area defined by an annular band extending around said ball, said first and second sections oriented relative to each other such that when finger holes are provided in said ball and said ball is rolled down said lane, said annular band is in rolling engagement with said lane, and said first portion of said outer surface initially engages said erect tenpins.

4,613,138

TENNIS RACQUET WITH FLEXIBLE MEMBRANE FRAME

James Haythornthwaite, 567 Main Road, Hudson, Quebec, Canada J0P 1J0

Filed Jul. 9, 1984, Ser. No. 628,994

Int. Cl.[4] A63B *51/12*

U.S. Cl. 273—73 E **13 Claims**

10. A sports racquet comprising:

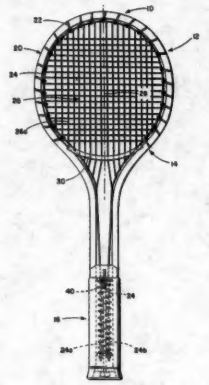
a frame including a head portion defining a central opening having an inner peripheral surface facing said central opening, and a handle portion;

a flexible membrane;

connecting means attached to said inner peripheral surface for connecting said flexible membrane to said head portion;

strings connected to said flexible membrane to space said strings away from said inner peripheral surface, said strings forming a grid pattern; and

tensioning means connected to said handle portion and said flexible membrane being connected to said tensioning



means, said tensioning means including biasing means for biasing said tensioning means, said tensioning means being biased for compression when a ball strikes said strings and for expansion when a ball leaves said strings to allow said flexible membrane to return to a pre-impact position occupied prior to said ball striking said strings, said biasing means adding bias energy to said strings in returning said flexible membrane to its pre-impact position by absorbing, storing and releasing energy during engagement and release of a ball by said strings.

4,613,139

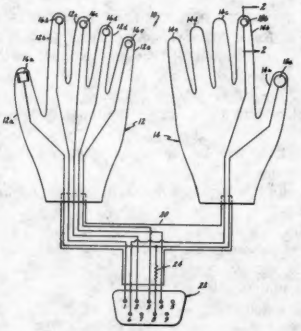
VIDEO CONTROL GLOVES

William H. Robinson, II, 3016 Sturtevant, Detroit, Mich. 48206

Filed Dec. 10, 1984, Ser. No. 679,989

Int. Cl.[4] A63F *9/22*

U.S. Cl. 273—148 B **2 Claims**



1. Apparatus for providing switch-closure control signal inputs to a joystick control port of a video console or the like, such control port being of predetermined configuration in

which signal inputs consist of electrical closure between a common terminal at said port and one or more signal terminals, said apparatus comprising

a first glove having a thumb portion and four finger portions separate from each other and from said thumb portion,

a second glove having a thumb portion and at least one separate finger portion,

electrical contact means affixed to each of said thumb and finger portions of said first glove adjacent to the tips thereof and to said thumb portion and said one finger portion of said second glove adjacent to the tips thereof, such that physical contact between a thumb portion of one of said gloves and one or more of said finger portions of the corresponding glove obtains electrical connection between the corresponding contacts on said portions,

a connector constructed for removable mating engagement with a control port, said connector having common and signal terminals for individual mating engagement with common and signal terminals of a control port,

first connection means individually electrically connecting said contacts on said finger portions of said first gloves to signal terminals of said connector,

second connection means electrically connecting said contact on said thumb portion of said first glove to said common terminal at said connector, said second connection means including resistance means connected in series between said connector common terminal and said contact on said thumb portion,

third connection means electrically connecting said contact means on said finger portion of said second glove to a signal terminal on said connector, and

fourth connection means electrically connecting said contact on said thumb portion of said second glove to said resistance means such that said resistance means is connected in series between said connector common terminal and the contacts on the thumb portions of both said gloves.

4,613,140

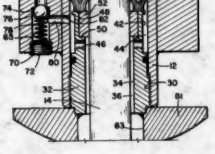
SELF-ALIGNING LUBRICATING STUFFING BOX

Gary W. Knox, P. O. Box 124, Langley, Okla. 74350

Filed Oct. 17, 1984, Ser. No. 661,666

Int. Cl.[4] F16J *15/18, 15/48*

U.S. Cl. 277—3 **16 Claims**



1. A stuffing box for a movable polish rod within a well bore associated with a reciprocating downhole pump for producing fluid from a fluid reservoir, said stuffing box comprising housing means secured around the outer periphery of the polish rod and concentrically arranged with respect thereto such that said polish rod passes through said housing, an internal cooling chamber provided in the housing and in engagement with the outer periphery of the polish rod, packing means provided in the housing and disposed at the upper and lower ends of the cooling chamber, fluid passageway means providing communication between the cooling chamber and the interior of the housing below the lowermost packing means for establishing communication between the cooling chamber and the well bore for circulating fluid therebetween, and valve means provided in the passageway means for automatically establishing the communication between the cooling chamber and fluid reservoir as required during reciprocation of the polish rod.

4,613,141

HYDROSTATIC AND HYDRODYNAMIC SEAL FOR ROTATING A ROTATING SHAFT

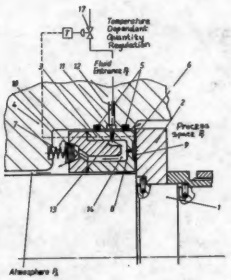
Manfred Heinen, Rees, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,481

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447102

Int. Cl.[4] F16J *15/34, 15/46*

U.S. Cl. 277—27 **4 Claims**



1. A hydrostatic and hydrodynamic seal for a rotating shaft, comprising a revolving ring revolving with the shaft, a static ring movable only axially in respect to the shaft and forming radial seal gaps with said revolving ring, a housing supporting the shaft, a pair of axially spaced O-rings sealing said static ring with said housing and permitting the axial mobility of said static ring, said static ring with said revolving ring forming radial gaps for the flow of an incompressible fluid therethrough and having a liquid flow cavity for the fluid with an end passage, a valve ring engageable in the end passage, and spring means biasing said valve ring into the flowthrough end passage for limiting the pressure of the fluid.

4,613,142

SLIDE-RING SEAL WITH DISTORTION PREVENTION CONSTRUCTION

Antti-Jussi Heilala, Järvenpää, Finland, assignor to Oy Safematic Ltd., Muurame, Finland

Filed Dec. 30, 1985, Ser. No. 814,412

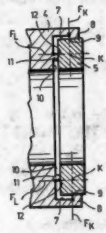
Claims priority, application Finland, Jan. 16, 1985, 850190

Int. Cl.[4] F16J *15/34, 15/38*

U.S. Cl. 277—81 R **5 Claims**

1. Slide-ring seal for sealing a shaft (2) rotating with respect to a wall, said slide-ring seal comprising a frame portion provided with connections for a sealing liquid, and seal rings (4) provided with slide rings (5) and positioned with respect to each other in such a manner that the sealing slide surfaces of the slide rings (5) are pressed against each other and rotate with respect to each other, whereby each slide ring (5) is fastened on the seal ring (4) thereof by means of a shrinkage fit so that the radial press force (F_K) of said shrinkage fit is wholly directed to act on the centre of mass (K) of the cross-sectional

area of the slide ring (5), characterized in that the axial force (F_L) created by deformations of the seal ring (4) is wholly



directed to act on the centre of mass (K) of the cross-section of the slide ring (5).

4,613,143

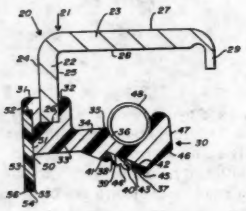
DUAL-LIP SHAFT SEAL WITH ONE SPRING-URGED LIP

John D. Butler, Van Wert, Ohio, assignor to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 598,857, Apr. 11, 1984, Pat. No. 4,578,856. This application Dec. 2, 1985, Ser. No. 803,702

Int. Cl.⁴ F16J *15/32*

U.S. Cl. 277—134 **8 Claims**



1. A dual-lip shaft seal with two polytetrafluoroethylene sealing members bonded to a molded elastomeric body, including in combination;

a metal case having a radially inwardly extending flange with an inner end,

an elastomeric member bonded to said flange and providing on one side thereof a shaped lip body with a frustoconical outwardly recessed wall on its radially inner side,

a frustoconical ring of polytetrafluoroethylene bonded to said frustoconical recessed wall, and providing the actual sealing portion of its said lip, and

a radially extending polytetrafluoroethylene washer bonded on one side to said elastomeric member on the opposite side of said radial flange from said lip body.

4,613,144

STEERING SYSTEM FOR VEHICLES

Yoshimi Furukawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

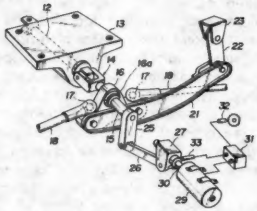
Filed Oct. 10, 1984, Ser. No. 659,321

Claims priority, application Japan, Oct. 17, 1983, 58-193662

Int. Cl.⁴ B62D *7/00*

U.S. Cl. 280—91 **3 Claims**

1. In a steering system for vehicles including a steering wheel, a front wheel, front steering means for steering said front wheel, a rear wheel, rear steering means for steering said rear wheel, ratio changing means for changing the steered angle ratio of said rear wheel to said front wheel, control means for controlling said ratio changing means, ratio detecting means for detecting the steered angle ratio, said ratio detecting means cooperating with said control means, speed detecting means for detecting the vehicle speed, and said speed detecting means cooperating with said control means, in which said rear wheel is steered at relatively low vehicle speeds in the opposite direction to said front wheel or substantially at an



angle of zero degree and at relatively high vehicle speeds in the same direction as said front wheel, the improvement comprising: said control means having signal variation moderating means for moderating the variation of a vehicle speed signal from said speed detecting means, so that the steered angle ratio is moderately corrected even when the vehicle speed is suddenly changed.

4,613,145

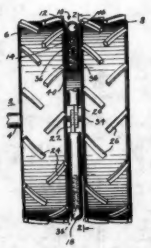
DUAL WHEEL CLEANER

Frank Greff, Sr., Rte. 1, Box 123, Berlin, Wis. 54923

Filed Jan. 29, 1985, Ser. No. 696,252

Int. Cl.⁴ B60S *1/68*

U.S. Cl. 280—158 A **9 Claims**



1. In a device having dual wheels for rolling along the ground and subject to clogging of material such as mud and the like between the wheels, a dual wheel cleaner comprising a third wheel between said dual wheels and radially movable relative thereto such that material creeping up between said dual wheels at the bottom pushes said third wheel upwardly such that as said dual wheels rotate, material is discharged by said third wheel radially outwardly from between the top periphery of said dual wheels,

wherein said dual wheels are mounted on a central hub and wherein said third wheel is resiliently radially supported on said hub,

wherein said third wheel has a plurality of partially radially inwardly extending studs having inner ends radially spaced from said hub, and a plurality of coil springs mounted and retained on said studs, the inner ends of said springs bearing against said hub.

4,613,146

MONOCOQUE BICYCLE FRAME

Timothy M. Sharp, 7139 Linden Ter., Carlsbad, Calif. 92008, and Donald C. Stephan, 4585 Pembroke, Reno, Nev. 89502

Filed May 3, 1984, Ser. No. 606,649
Int. Cl.[4] B62K 3/14
U.S. Cl. 280—281 B 10 Claims

1. A monocoque bicycle frame which comprises:

panel means defining a hollow frame body having generally flat, spaced side walls, top and bottom walls, and front and rear ends,

a rearward portion of said body being bifurcated into a pair of spaced rear sections defining a rear wheel well therebetween;

a head tube mounted on said body proximate its said front end, and a rear wheel dropout mounted on each of said pair of rear sections proximate its rear end;

a bottom bracket extending generally transversely between said side walls and having sides exposed externally of said side walls;

said bottom bracket being rotatably constructed for supporting a pedal sprocket on one side thereof that is external of said body and pedals on both sides thereof;

means proximate said top wall for mounting a seat on said body; and

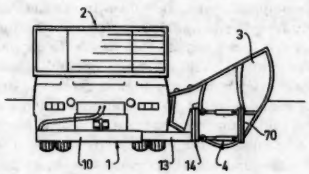
transverse bulkhead means extending across the hollow inside of said body and connected at its sides to the respective said side walls, said bulkhead means extending upwardly from proximate said bottom bracket to proximate said top wall, said seat mounting means being connected to said bulkhead means.

4,613,147

REAR UNDERRIDE BUMPER AND SIDE-DRAFT SUPPORT

Gösta Kjellqvist, Vålberg, Sweden, assignor to AB Mahler & Soner, Rosson, Sweden

PCT No. PCT/SE84/00422, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/02588, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 12, 1984, Ser. No. 775,048
Claims priority, application Sweden, Dec. 12, 1983, 8306854
Int. Cl.[4] B60D 1/14
U.S. Cl. 280—473 7 Claims



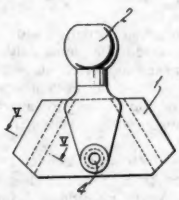
1. A rear underride bumper and side-draft support (1) for vehicles, especially for trucks (2) comprising a fixed bar (10) transversal to the direction of motion of the vehicle (2) and means (11, 12) for securing the fixed bar (10) relative to the vehicle (2), characterized in that it (1) comprises a movable bar (13) displaceably arranged in the longitudinal direction of the fixed bar (10), means (15) for effecting the displacement of the moveable bar (13), the movable bar (13) having a means of attachment (14) at one of its two ends to enable the fitting of implements.

4,613,148

DETACHABLE TOWING BRACKET

Bob Scholte, Dongen, Netherlands, assignor to Tobo Made B.V., Made, Netherlands

PCT No. PCT/EP84/00078, § 371 Date Nov. 16, 1984, § 102(e) Date Nov. 16, 1984, PCT Pub. No. WO84/03666, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 15, 1984, Ser. No. 674,954
Claims priority, application Netherlands, Mar. 21, 1983, 8300996
Int. Cl.[4] B60D 1/06
U.S. Cl. 280—491 E 4 Claims



1. A detachable towing bracket for a vehicle, comprising:

a towing hook having a first coupling member, said first coupling member being slidably engageable in a dovetailed connection with a second coupling member attachable to said vehicle, said first and second coupling members being disengageable upon sliding of said first coupling member in a first direction, and engageable upon sliding of said first coupling member in a second direction opposed to said first direction, said first coupling member being provided with at least one groove adapted to fit at least one corresponding raised edge on said second coupling member, said groove and said edge correspondingly tapering in cross-section, said second coupling member being provided with a substantially flat plate slidably mountable in a corresponding slot on said first coupling member;

a retaining means for securing said first coupling member to said second coupling member, said retaining means being insertable through said first coupling member into said second coupling member through said dovetailed connection and comprising a barrel aligned substantially parallel to said first coupling means and a pin movably contained within said barrel, said pin having a tapered end insertable into said dovetailed connection, said barrel further having an open end oppositely disposed to said tapered end; and,

a spring-loaded locking mechanism provided on said barrel comprising a spring internal to said barrel, said spring being compressed upon locking of said retaining means in said dovetailed connection, said compression being maintained by a lug insertable into said open end.

4,613,149

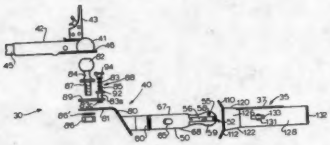
SELF-COUPLING TRAILER HITCH

Thomas M. Williams, Jr., Rte. 8, Box 414, Durham, N.C. 27704

Continuation-in-part of Ser. No. 674,524, Nov. 23, 1984, Pat. No. 4,560,184. This application Feb. 7, 1985, Ser. No. 699,354

Int. Cl.[4] B60D *1/02*

U.S. Cl. 280—508 **12 Claims**



1. An automatic trailer hitch assembly for use with a towing vehicle and a towed trailer or other towed vehicle having a metal-formed housing with a ball socket at its towing end, comprising:

(a) an elongated shank unit on the towed vehicle, said shank unit extending between leading and trailing ends and including:

(i) at the trailing end a ball member supported on a threaded stud secured to said trailing end and releaseably coupled in the ball socket of said housing;

(ii) at the leading end curved surfaces facilitating the guidance of said leading end when in contact with guide surfaces; and

(iii) a leveler assembly mounted on said trailing end comprising:

(aa) a plate member supported on and releasably secured by said stud to said trailing end; and

(bb) clamping means supported on and above said plate member and operative for resiliently and slidably grasping a portion of said housing to support said elongated shank unit appropriately positioned for coupling to a receiving unit;

(b) a receiving unit on the towing vehicle having an entry wall portion formed for guiding said leading end and leading therefrom a tubular portion providing a bore for receiving a predetermined length of said shank unit; and

(c) spring-loaded locking means mounted on said receiving unit and having a first cocked position in which said locking means is held latched and sufficiently free of said bore to permit passage of said shank structure unit therein and an uncocked position in which said locking means is unlatched and freed for releasably locking said shank unit and tubular structure together, said shank unit and locking means being operatively associated such that entry of said shank unit into said bore acts to release said locking means from said cocked to said uncocked position.

4,613,150

TOE BINDING FOR SKIS

Roderick A. Cooper, Pierrefonds, Canada, assignor to Warrington Inc., Montreal, Canada

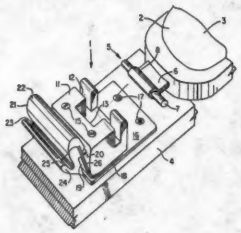
Continuation of Ser. No. 408,591, Aug. 16, 1982, Pat. No. 4,438,947. This application Mar. 23, 1984, Ser. No. 592,862

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] A63C *9/10*

U.S. Cl. 280—615 **3 Claims**

1. A toe binding and boot combination for a cross country ski, the boot including a toe end and a longitudinal projection extending forward of the toe end, a pair of laterally extending pivot members extending one on either side of said longitudinal projection, the binding comprising a body adapted to be mounted to a ski, the body including a longitudinally defined recess open towards a first end of the body and adapted to receive said longitudinal projection, a pair of opposed, laterally extending, substantially vertical slots open to the top of the body communicating with said longitudinally defined recess and adapted to receive said pivot members, retaining means slidably mounted within said body for horizontal longitudinal sliding movement between a first position closing said pair of slots and adapted to entrap said pivot members within said slots and a second position clear of said slots adapted to release said



pivot members, resilient means in said body urging said retaining means to said first position, common means for moving said retaining means against said resilient means to simultaneously clear said slots, whereby when the pivot members of the boot are entrapped within the slots, the boot may be pivoted through a limited arc about an axis formed by the pivot members transverse to the longitudinal axis of said boot.

4,613,151

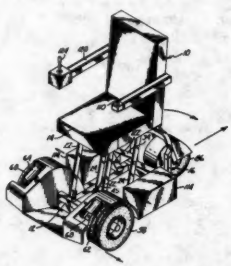
HIGH/LOW EXTENSION-LIFT POWER WHEELCHAIR

William J. Kielczewski, 9123 Beaudry St., Duluth, Minn. 55808

Filed Feb. 16, 1984, Ser. No. 580,739

Int. Cl.[4] B62D *63/02*

U.S. Cl. 280—650 **17 Claims**



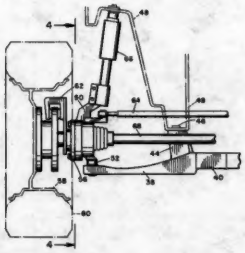
1. A wheelchair adapted to selectively position the rider in positions of varying height from the ground comprising: a main frame; two drive wheels operably secured to said frame; a seat operably secured to said main frame and adapted to be selectively raised or lowered; an extension structure operably secured to said frame and adapted to selectively move relative to said main frame; coupling means operably secured to said seat, to said main frame, and to said extension structure said coupling means adapted to extend said extension structure relative to said main frame when said seat is lowered and to draw said extension structure towards said main frame when said seat is raised; a wheel operably secured to said extension structure, said wheel adapted to have selectively limited castering and adapted to support said wheelchair as a third point cooperating with said two drive wheels.

4,613,152

COMPOSITE TRANSVERSE BEAM AND SPRING SYSTEM FOR AN AUTOMOBILE

Benjamin V. Booher, 1721 Aldersgate, Leucadia, Calif. 92024

Filed May 1, 1985, Ser. No. 729,474
Int. Cl.[4] B16F *1/30*
U.S. Cl. 280—669 **19 Claims**



14. A vehicle suspension system comprising:

a uni-body frame;

an elongate member having a composite construction including fibers held together with a binder, the member having opposite spring portions connected by an intermediate beam portion, each spring portion being dimensioned and configured to be flexible and resilient when a predetermined set of wheel loads are applied to an outer end thereof, and the intermediate beam portion being dimensioned and configured to provide a substantially rigid structural element when the predetermined set of wheel loads are applied to the spring portions; and

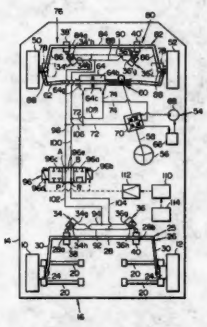
means for connecting the intermediate beam portion to the uni-body frame so that the elongate member extends horizontally in a transverse direction across the frame and the opposite spring portions can flex upwardly and downwardly relative to the frame when the predetermined set of wheel loads are applied to the outer ends of the spring portions.

4,613,153

STABILIZER FOR AN AUTOMOTIVE VEHICLE

Yasuji Shibahata, Yokohama; Yukio Fukunaga, Zushi; Kenji Nakamura, Yokohama; Yasumasa Tsubota, Yokosuka; Namio Irie, Yokohama, and Junsuke Kuroki, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 11, 1985, Ser. No. 700,200
Claims priority, application Japan, Feb. 14, 1984, 59-24488
Int. Cl.[4] B60G *11/00*
U.S. Cl. 280—689 **14 Claims**



1. A stabilizer for an automotive vehicle having a body and a pair of laterally opposed road wheels independently suspended on the vehicle body for upward and downward movement relative to each other and the vehicle body, said stabilizer comprising:

a stabilizer bar twistable about a rotational axis extending transversely of the vehicle to resist the relative upward and downward movement of the road wheels and having two attaching portions opposed along said axis at which it is to be attached to the vehicle body; and

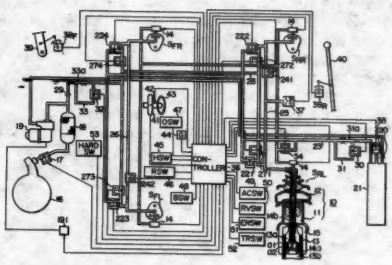
means for rotatably attaching said attaching portions to the vehicle body in such a manner that at least one of the attaching portions is movable upwardly and downwardly relative to the vehicle body to change the effectiveness of the stabilizer bar in accordance with variations of running condition of the vehicle.

4,613,154

VEHICLE SUSPENSION APPARATUS

Tadao Tanaka; Mitsuhiko Harara, both of Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki, and Naotake Kumagai, Aichi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 762,041
Claims priority, application Japan, Aug. 10, 1984, 59-167351; Aug. 10, 1984, 59-122663[U]; Aug. 10, 1984, 59-122664[U]; Sep. 27, 1984, 59-145998[U]
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 **21 Claims**



1. A vehicle suspension apparatus comprising:

fluid spring chambers provided at both right and left suspension units;

fluid supply means for supplying fluid through supply control valves to the fluid spring chambers of the suspension units;

fluid exhaust means for exhausting the fluid through exhaust control valves from the fluid spring chambers of the suspension units;

roll detecting means for detecting a roll of a vehicle body;

roll control means for reducing said roll of the vehicle body by opening the supply control valve for the fluid spring chamber on the compressed side and opening the exhaust control valve for the fluid spring chamber on the elongated side during the set control period of time on the basis of a signal from the roll detecting means;

hard/soft switching means provided in the suspension units for switching the suspension units to either the hard or soft state;

running state detecting means for detecting the running state of the vehicle; and

hard/soft control means for controlling the hard/soft switching means so that the suspension units become soft when the running state detected by the running state detecting means satisfies the set condition and controlling the hard/soft switching means so that the suspension units

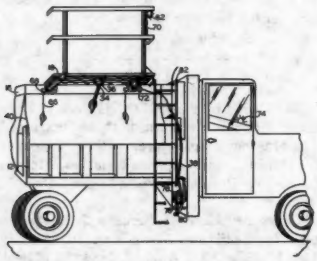
become hard when the running state does not satisfy the conditions.

4,613,155

SAFETY PLATFORM ASSEMBLY FOR SANDING TRUCKS

William P. Greenwood, R.D. 1, Box 260, Crown Point, N.Y. 12928

Filed Dec. 3, 1984, Ser. No. 677,606
Int. Cl.[4] B60R *21/00*
U.S. Cl. 280—760 **19 Claims**



1. A collapsible platform assembly for external mounting to a side of a hopper of a truck for supporting an individual in an elevated position such that the individual can safely observe and facilitate the top loading of the truck hopper, comprising:

a platform capable of supporting the weight of an individual;

means for mounting the platform to an external side the truck hopper; and

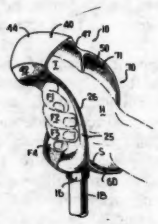
power driven actuating means for selectively moving the platform between a substantially horizontal position and a substantially vertical position, in its substantially horizontal position the platform being employed to support an individual at a safe location near a top opening of the truck hopper and in its substantially vertical position the platform extending below said mounting means and being stored unobtrusively at a location adjacent to said side of the truck hopper.

4,613,156

SKI POLE HANDLE

Thomas Z. Lajos, 2454 W. Oakfield Rd., Grand Island, N.Y. 14072

Filed Mar. 26, 1985, Ser. No. 716,081
Int. Cl.[4] A63C *11/22*
U.S. Cl. 280—821 **7 Claims**



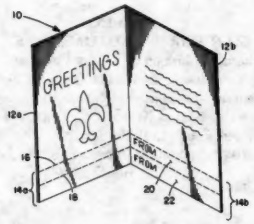
1. A ski pole handle comprising a main gripping portion defined by an upstanding elongated body having upper and lower body portions, opposite inboard and outboard lateral faces, a forward face and an opposite convexly curved rear face; a generally tubular thumb-receiving channel disposed at said upper body portion, said elongated body defining a handgrip portion disposed beneath said thumb-receiving channel and being adapted to accommodate and be gripped between a skier's fingers and palm, said thumb-receiving channel having an inner bottom thumb-supporting generally convexly curved surface merging in continuity with said convexly curved rear face whereby a skier's thumb and particularly the phalanges, metacarpus and the ulnar collateral ligament of the metacarpophalangeal joint are protected against injury normally attributed to abduction/extension of the thumb which is the usual cause of typical collateral ligament injury resulting from a skiing fall; said thumb-receiving channel includes a rear-entry opening through which a person's thumb is inserted into said thumb-receiving channel and a front opening through which a person's thumb is visible when seated within said thumb-receiving channel; said thumb-receiving channel being additionally defined by a pair of spaced inboard and outboard lateral walls, said outboard lateral thumb-receiving channel wall merging progressively downwardly with a juncture surface between said rear face and said outboard lateral face, a laterally outboard knuckle-protecting sheath ascending both laterally and forwardly from said body lower portion, a laterally outboard knuckle-protecting sheath depending both laterally and forwardly from said thumb-receiving channel, said sheaths having spaced adjacent edges of sufficient flexibility for permitting the release therethrough of a skier's hand during a severe skiing fall, and means at said lower body portion defining an upwardly facing ledge along said forward, rear and outboard lateral faces for supporting the hypothenar surface and fingers of a skier's hand.

4,613,157

REUSABLE GREETING CARD

Steve Drabish, 7740 Dunham Rd., Walton Hills, Ohio 44146, assignor to Steve Drabish and Roger A. Johnston, both of Walton Hills, Ohio

Filed Jul. 18, 1983, Ser. No. 514,937
Int. Cl.[4] B42D *15/00*; B65D *27/00*
U.S. Cl. 283—1 R **10 Claims**



3. An extended use greeting card ensemble comprising:

(a) a single fold material card proper having the greeting message disposed on the upper portion of the card with fold disposed vertically and having a pre-weakened region extending across the full width of the card adjacent the lower margin of the card to divide the card into an upper message portion and lower signature section, said pre-weakened region being frangible to readily permit removal of the signature section, whereby the entire card proper becomes shorter in length and whereupon the portion of the card adjacent said frangible region becomes the signature section for a next user;

(b) a first envelope sized to receive the card with said signature portion attached; and,

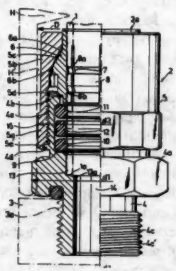
(c) an additional envelope received accompanying said first envelope, said additonal envelope sized to fit said card only after removal of said signature section.

4,613,158

ARRANGEMENT FOR A COUPLING WITH A FIRST AND A SECOND COUPLING PART AND A METHOD FOR PRODUCTION OF THE COUPLING

Kjell R. Ekman, Aberenrain 43,6340 Baar, Switzerland

Filed Aug. 10, 1983, Ser. No. 521,801
Claims priority, application Sweden, Aug. 27, 1982, 8204911
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—3 9 Claims



1. An article comprising a coupling unit having a first coupling part and a second coupling part which can be displaced longitudinally relative thereto, said first coupling part comprising a first nut-shaped section and said second coupling part comprising a second nut-shaped section and an elongated cylindrical portion adjacent to said second nut-shaped section wherein said cylindrical portion and said second nut-shaped section are made of a single piece of steel, formed from a tube having a polygonal cross-section and wherein said second nut-shaped section has reduced corners and side surfaces connected to said corners, in parallel with the side walls of said first nut-shaped portion and wherein the number of said corners and said side surfaces of said second nut-shaped section is doubled relative to the number of corners and walls of said first nut-shaped section and wherein the second nut-shaped section is made with a cross-section measurement which allows the passage of the internal surface of a tightening and/or loosening sleeve over said second nut-shaped section and interaction of said tightening and/or loosening sleeve with said first nut-shaped section and wherein a gap formed between the internal surface of the tightening and/or loosening sleeve and said side surfaces of said second nut-shaped section does not exceed 0.1 mm.

4,613,159

PRESSURE-ASSISTED DYNAMIC SEAL APPARATUS

Allen E. Harris, and David D. Szarka, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

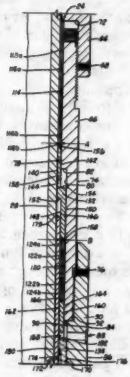
Filed Oct. 26, 1984, Ser. No. 664,907
Int. Cl.[4] F16L *17/02*
U.S. Cl. 285—3 17 Claims

1. A pressure-assisted dynamic seal apparatus for providing a seal between first and second members, said seal apparatus comprising:

first seal means for engaging said first and second members, said first seal means having a first cross-sectional area;

second seal means, disposed between said first and second members, for receiving from a first direction a first pressure associated with said first member and for receiving from a second direction a second pressure associated with said second member, said second seal means has a second cross-sectional area greater than said first cross-sectional area;

third seal means, disposed between said first and second members, for receiving from said first direction said second pressure and for receiving from said second direction said first pressure, said third seal means has a third cross-sectional area greater than said second cross-sectional area; and



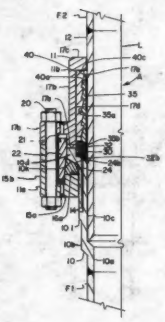
coupling means for coupling said second and third seal means in force transferring association with said first seal means.

4,613,160

REMOTELY OPERABLE PIPE LENGTH CONNECTOR AND COMPENSATOR

Bobby J. Reneau, Houston, Tex., assignor to Gripper, Inc., Houston, Tex.

Filed Jun. 8, 1984, Ser. No. 618,436
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—18 15 Claims



1. A pipe length connector and compensator for connecting together pipeline portions with a varying distance therebetween, comprising;

a first housing adapted for connection to a first flowline portion;

a second housing cooperating with said first housing to receive a second flowline portion which extends through said second housing into said first housing; said first and second housings having a common central axis;

said second housing including first and second body members and connection means are mounted with said first and second body members for connecting together said first and second body members;

said first housing and said second housing cooperating to form a grip/seal bore therein through which said second flowline portion extends into said first housing, said sec-

ond body member having an annular end portion which defines a part of said grip/seal bore;

seal means mounted in said grip/seal bore for movement into sealing engagement against said second flowline portion;

actuator means mounted in said grip/seal bore for movement into engagement with said seal means to move said seal means into sealing engagement with said second flowline;

force transfer means mounted within said grip/seal bore for axial movement into engagement with said actuator means, said force transfer means being positioned between said actuator means and second body annular end portion and adjacent to and in engagement with said annular end portion of said second body member; and

remotely actuable means mounted with said first and second body members for engagement with a portion of said first housing and said first body member to move said first body member in an axial direction away from said first housing portion to thereby move said second body member axially toward said first housing to cause said annular end portion of said second body member to axially engage said force transfer means, said force transfer means axially engaging said actuator means and said actuator means engaging and moving said seal means radially inwardly to seal against said second flowline.

4,613,161

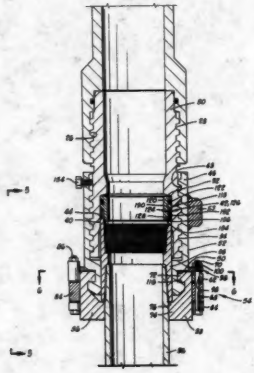
COUPLING DEVICE

David P. Brisco, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 374,869, May 4, 1982, Pat. No. 4,524,998. This application Mar. 8, 1985, Ser. No. 709,628

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—18 **10 Claims**



1. A coupling apparatus for connection to a casing string conducting the flow of fluid therethrough in a well, which casing string has an enlarged diameter casing collar connected to an upper end of a length of well casing, said apparatus comprising:

a body having a bore therethrough;

a main seal means, operably associated with said body, for sealing between said body and an annular upper end surface of said casing collar;

an adjusting means having a variable engagement with said body so that a longitudinal position of said adjusting means relative to said body may be varied;

an annular locking means, connected to said adjusting means for longitudinal movement therewith relative to said body, for locking said body to said casing string, said locking means having a lower end movable between an open radially expanded position wherein said casing collar can pass through a central opening of said lower end, and a closed radially contracted position wherein a radially inward extending lip means of said lower end of said locking means is located directly below an annular lower end surface of said casing collar;

hydraulically biased seal carrier means, operably associated with said main seal means, for increasing a compression of said main seal means against said annular upper end surface of said casing collar in response to increases in hydraulic pressure of said fluid within said casing string; and

wherein said body, said main seal means, said adjusting means, said annular locking means, and said hydraulically biased seal carrier means are so arranged and constructed relative to each other that an initial compression loading of said main seal means against said annular upper end surface of said casing collar may be provided by closing said lower end of said annular locking means and varying said variable engagement of said adjusting means with said body so that said lip means of said lower end of said annular locking means engages said annular lower end surface of said casing collar and so that said body member, seal carrier means and main seal means are moved downward relative to said annular locking means until said main seal means is compressed against said annular upper end surface of said casing collar.

4,613,162

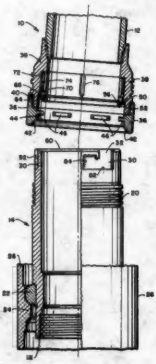
MISALIGNMENT TIEBACK TOOL - NON-ROTATING CASING

David W. Hughes, Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Oct. 12, 1984, Ser. No. 659,605

Int. Cl.[4] F16L *21/00*

U.S. Cl. 285—27 **8 Claims**



1. A tieback tool for connecting a tieback conductor to a subsea well system comprising:

a hollow tubular body member connected to the tieback conductor,

lockdown and aligning means on said tubular body member for aligning and locking said tool on said well system, including,

ring means threadably engaged within said tubular body member,

radially inwardly extending dogs on said tubular body member and adapted to engage one or more locking means on said well system, upon initial engagement of said tubular body member with said well system to commence the process of alignment of said tool with said well system by resting on a bottom surface in said locking means, said dogs and said ring means being arranged so that rotation

of said ring means locks said radially extending dogs in said locking means after all of said dogs have been received in said locking means and are resting on said bottom surfaces by lifting said dogs off said bottom surface and into a locked position within said locking means.

4,613,163

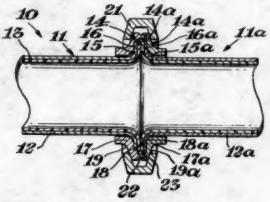
JOINT FOR PIPE

Sandor Grosshandler, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1985, Ser. No. 794,809

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—27 **3 Claims**



1. An improved pipe joint, the pipe joint comprising a plastic lined conduit having a synthetic resinous pressure deformable liner disposed within a pressure deformable metal conduit, said plastic lined conduit having at least one end, the conduit end defining a radially outwardly projecting flange composed of deformed metal of the metal conduit and deformed plastic of the liner, a loose ring having a generally planar face and a tapering face, the loose ring being disposed about the conduit with the generally planar face of the ring disposed against a metal portion of the outwardly projecting flange, the loose ring having the tapering face remote from the radially outwardly projecting flange, the tapering face tapering outwardly toward a periphery of the flange, a split "V" clamp disposed about the loose ring and an opposed tapering surface of generally like configuration to the tapering face of the loose ring, and the split "V" clamp thereby forcing the deformed plastic of the liner against an opposed liner engaging sealing surface, the improvement which comprises providing as loose rings having a face remote from the tapering face defining at least one land and one groove, the land and groove being of generally arcuate configuration and having a center of generation at the center of the ring, the groove subtending a greater angle with the center of generation than the land, the land adapted to interfit with a groove of a like ring and thereby center adjacent pipe ends.

4,613,164

MISALIGNMENT TIEBACK TOOL - ROTATING CASING

David W. Hughes, and Lionel J. Milberger, both of Houston, Tex., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Oct. 12, 1984, Ser. No. 659,603

Int. Cl.[4] F16L *21/00*

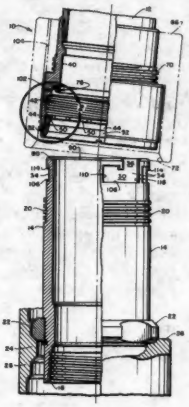
U.S. Cl. 285—27 **9 Claims**

1. A tieback tool for connecting a tieback conductor to a subsea well system comprising;

a hollow tubular body member connected to the tieback conductor,

a lockdown and aligning means on said tubular body member for aligning and locking said tool on said well system, including

ring means threadably engaged to said tool body member and itself having radially inwardly extending ring locking means adapted to engage one or more locking means on said well system upon initial engagement of said tubular body member with said well system to commence the process of alignment of said tool with said well system by resting on a bottom surface of said well system locking means and thereafter engage all said ring locking means and thus aligning said tool with said well system,



both said locking means thereafter functioning to rotate said ring means to lock said tool onto said well system by raising said ring locking means within said well system locking means by rotation of said tieback conductor.

4,613,165

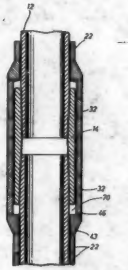
INCREASED TENSILE STRENGTH VARIABLE DIAMETER PROTECTIVE JOINT

Karl F. Kuhne, Spring, Tex., assignor to Carbide Blast Joints, Inc., Houston, Tex.

Filed May 10, 1985, Ser. No. 732,703

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—45 **16 Claims**



1. A protective joint for tubulars having a body portion with a first diameter and at least one coupling portion connected to the body portion and having an increased diameter portion, at least a part of both the first and increased diameter portions being included within a zone to be protected by the protective joint, said protective joint comprising:

a plurality of first and second generally cylindrical annular protective rings, said first protective rings being coaxially located along the body portion of the tubular and said second protective rings being coaxially located along the increased diameter portion of the coupling portion, said first and second protective rings having flat and parallel faces, having sufficient inside diameters and being engaga-

ble with like protective rings along a plane intersecting the inside longitudinal axis of the tubular to accommodate bending movements along the longitudinal axis of tubular;

at least one transition ring formation having first and second flat and parallel faces, said transition ring formation having an inside diameter and outside diameter at its first face approximately equal to the inside and outside diameter, respectively, of the first protective rings and said transition ring formation having an inside diameter and outside diameter at its second face approximately equal to the inside and outside diameter, respectively, of the second protective rings, the exterior surface of said transition ring formation comprising a generally continuous surface from the first face to the second face of the transition ring formation and the interior surface of said transition ring formation being configured to provide a space along the connection between the coupling portion and the body portion of the tubular sufficient to accommodate longitudinal movement of the protective device with respect to the tubular; and

biasing means coaxially located along at least some portion of the tubular, said biasing means being engagable at one end with a retainer locatable on the tubular and at the other end with at least one of the protective rings to bias the first and second protective rings and the transition ring formation to thereby form a protective shield along the entire zone to be protected.

4,613,166

CONNECTING CONCENTRIC TUBE SYSTEMS

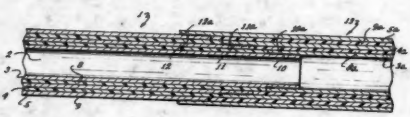
Hans-Martin Schmidtchen, Osnabrueck, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Gutehoffnungshuette, Hanover, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,774

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325757

Int. Cl.⁴ F16L *11/12*

U.S. Cl. 285—53 **7 Claims**



6. A coupler for interconnecting concentric tube sections, the coupler being comprised of a plurality of concentrically arranged sleeves wherein outer ones project at both ends axially beyond inner ones, and respective exposed end portions, as well as the end portion of the innermost of the coupler sleeves, being provided with the same pitch threading, there being electrically insulating layers interposed between adjoining coupler sleeves.

4,613,167

INSULATING PIPE JOINT

Kazuo Okahashi; Osamu Hayashi; Isao Ishii, and Toshiyuki Kobayashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

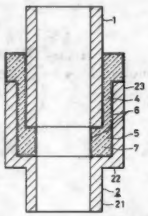
Continuation of Ser. No. 391,767, Jun. 24, 1982, abandoned. This application Dec. 23, 1985, Ser. No. 814,022

Claims priority, application Japan, Jun. 30, 1981, 56-102805

Int. Cl.⁴ F16L *59/14*

U.S. Cl. 285—54 **3 Claims**

1. An insulating pipe joint comprising a first tubular member, a second tubular member comprising a cylinder having the same inside diameter as that of the first tubular member and an annular metal stopper at one end of said cylinder whose inside diameter is larger than the outside diameter of the first tubular member, said annular metal stopper nesting the first tubular member with a space left between said annular metal stopper and the first tubular member, and an insulator made of glass-/mica composition and a cured organic, solventless resin which is impregnated in vacuum under pressure and then cured, said insulator filling said space to hold the first and



second tubular members in position and provide air- and water-tightness, and securing the insulation creeping distance between each tubular member and wherein said pipe joint is capable of withstanding a water pressure of 150 kg/cm² at both 25° C. and 300° C.

4,613,168

METHOD OF MAKING BRANCHES IN HOSES

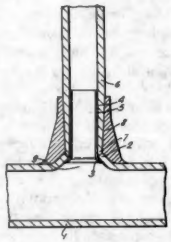
Ian P. Smith, Holt; David L. Prandle; Reginald C. Barker, and Robert M. J. Litherland, all of Bradford-on-Avon, all of England, assignors to Avon Industrial Polymers Limited, Wiltshire, England

Filed Feb. 28, 1983, Ser. No. 470,707

Claims priority, application United Kingdom, Mar. 4, 1982, 8206443

Int. Cl.⁴ F16L *41/00*

U.S. Cl. 285—150 **16 Claims**



1. A branched hose comprising:

a main hose portion of distortable material, a segment of said main hose defining a marginal portion around an opening in said hose, said opening having an inner circumferential surface,

a rigid insert comprising a tubular stem having two ends, one of said ends being outwardly flared, the diameter of said tubular stem distal from said flared end being greater than the undistorted diameter of said opening, the said insert being located in said opening with its flared end inwardly of the outer surface of said marginal portion and its stem projecting outwardly of said main hose whereby the inner circumferential surface of the opening in said marginal portion is outwardly biased in an outwardly distorted condition and

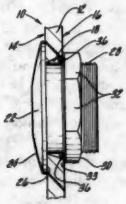
an encapsulation overlying said marginal portion and bonding at least said marginal portion of said main hose and said stem of said insert whereby to retain the insert in the main hose by holding and reinforcing said marginal portion in its said distorted condition.

4,613,169

SPA FITTING SEALING SYSTEM

Jack Engelhart, Clio, Mich., assignor to Quality Pool Supply Co., Clio, Mich.

Filed Sep. 7, 1984, Ser. No. 648,297
Int. Cl.[4] F16L 3/04
U.S. Cl. 285—161 15 Claims



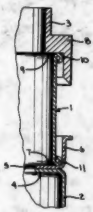
1. In combination, a pool wall construction comprising:
a pool wall composed of a plastic material and having inner and outer surfaces; said pool wall outer surface including a portion defining a continuous and uniformly tapered frustoconical hole through said wall to said inner wall surface, said portion being angled about 60 degrees with respect to said inner wall surface;
a pool inlet fitting constructed of a material compatible with said pool wall which dimensioned closely to the diameter of said hole, which passes through said hole, and which comprises a unitarily formed enlarged end having an annular flat surface disposable closely adjacent to said inner pool wall surface, and an externally threaded portion opposite said enlarged end;
a threaded nut disposed on said threaded portion of said pool inlet fitting, having an annular flat surface thereon facing said outer pool wall; and
a resilient seal member disposed between and abutting against each of said inlet fitting, said hole-defining portion of said pool wall outer surface, and said annular flat surface on said nut, so as to provide a waterproof seal between said fitting and said pool wall.

4,613,170

ADAPTOR FOR CONNECTING TUBULAR MEMBERS IN AN EXHAUST SYSTEM

Darrel Kersting, Black River Falls, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Dec. 20, 1984, Ser. No. 684,093
Int. Cl.[4] F16L 55/00
U.S. Cl. 285—187 1 Claim



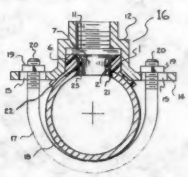
1. In an exhaust system for conducting an exhaust gas, a first tubular member, a first end of said first tubular member having a first axial opening of substantially constant diameter, an internal shoulder spaced from said first end of said first tubular member and having a smaller diameter than said first axial opening, a second tubular member, an end of said second tubular member having a second axial opening of substantially constant diameter, a second internal shoulder spaced from said end of the second tubular member and having a smaller diameter than said second opening, said openings being disposed in alignment, and a rigid metallic tubular adaptor connecting the aligned ends of said tubular members, the ends of said adaptor having reverse bends to provide outwardly curled ends freely disposed within the respective axial openings in said tubular members, the outer axial extremity of each curled end being seated against the respective shoulder and the outer radial extremity of each curled end being engaged with the wall of the respective tubular member bordering the opening therein, said adaptor providing a rigid sealed connection between said tubular members without auxiliary sealing members.

4,613,171

JUNCTION COUPLING WITH UNITARY LOCKING GASKET AND METHODS FOR THEIR USE

Daniel P. Corcoran, 709 Webb Dr., Bay City, Mich. 48706

Filed Oct. 18, 1984, Ser. No. 662,238
Int. Cl.[4] F16L 41/00
U.S. Cl. 285—197 17 Claims



1. A unitary locking gasket, comprising a compressable tube which tube forms a center bore of the unitary locking gasket; said tube being flared outwardly at one end; said tube essentially encased in an elastomeric housing, wherein said elastomeric housing comprises a unitary structure comprising (i) an elastomeric annulus which is beveled inwardly at the flared end of the tube, said annulus encasing the flared end of the tube; (ii) a spigot which is a continuation of the tube beyond the annulus; said spigot being encased in an elastomer and having lesser outer diameter than the outer diameter of the annulus; (iii) a flat annular elastomeric gasket, depending in a generally downward direction from the elastomeric annulus; said annular gasket having a saddle configuration which allows said unitary locking gasket to fit a pipe which has an aperture in the pipe wall through which the spigot passes.

4,613,172

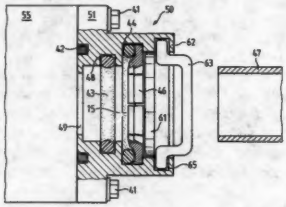
RELEASABLE PLUG-IN SOCKET PIPE COUPLING

Kurt Schattmaier, Zürich, Switzerland, assignor to Ceja AG, Zug, Switzerland

Filed Jun. 17, 1985, Ser. No. 745,222
Claims priority, application Switzerland, Jul. 10, 1984, 03330/84
Int. Cl.[4] F16L 19/08
U.S. Cl. 285—340 11 Claims

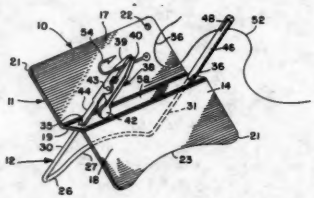
1. A plug-in socket coupling for pipes or pipe elements, comprising a socket member receiving at least one pipe end and which has in its interior, a radially inwardly directed projection, at least one circular groove for a packing, a passage opening, a chamber, a retaining element in said chamber fixing the pipe end which can be inserted up to the projection, wherein said retaining element comprises individual segmental portions, which largely embrace the pipe end and an elastic retaining ring in the chamber maintaining said segmental portions under pretension, each portion being tiltably supported with a top portion on the outer circumferential surface of the chamber and on the side facing the pipe end surface is provided with a base portion having at least a first cutting edge and

wherein an axially movable release ring is arranged in operative connection to the retaining element and which is axially



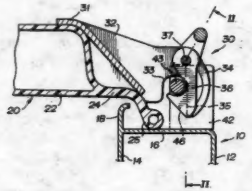
displaceable to pivot the tiltable portions into the release position.

4,613,173
KNOT TYING JIG
Robert Rosser, 7051 Old Mill Rd., Chesterland, Ohio 44026
Filed Dec. 12, 1983, Ser. No. 560,567
Int. Cl.[4] B65H *69/04*
U.S. Cl. 289—17 **14 Claims**



1. A knot tying jig comprising a panel having an upper and lower edge and opposite sides, a pair of stanchions each having a portion extending upwardly above the panel and downwardly below the panel, one stanchion on each opposite side of the panel, the portion of the stanchions extending downwardly below the panel cooperating with the lower edge of the panel to support the same extending upwardly at an angle in front of the user, and means on the portions of the stanchions extending generally upwardly above the panel and toward the user to hold a fishing line or fishing accessories to enable the user to use both hands to tie a fishing knot against the background of the panel.

4,613,174
REVERSIBLE LATCHING HINGE
Robin L. Berg, Hudson, Wis.; Douglas Morrissette, Plymouth, and Walter Ecker, North St. Paul, both of Minn., assignors to Syntechnics, Inc., Tenn.
Filed Dec. 24, 1984, Ser. No. 673,341
Int. Cl.[4] E05C *3/14*; B61D *39/00*
U.S. Cl. 292—136 **2 Claims**



1. A container having an upper opening defined in part by lateral sidewalls of said container, each lateral sidewall terminating at its upper end in an upper face,

a roof for said container comprising members for supporting said roof on said upper faces, and

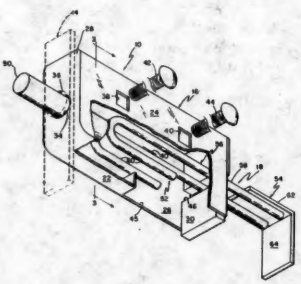
a first latch comprising

a latch bar mounted on an upper face and elevated above said upper face to provide a clearance between said latch bar and said upper face, and

a latch assembly fixed to said roof, said latch assembly comprising a flange fixed to said roof and projecting laterally therefrom over said latch bar, said flange terminating in an ear extending downwardly past said latch bar, closely adjacent thereto and disposed laterally outward thereof, said flange, ear and latch bar comprising pivot means about which said roof pivots when said container is inverted in a first direction for discharging its contents, said ear and said latch bar comprising means for preventing said roof from moving laterally with respect to said container during said inversion, said latch assembly further comprising a first hook attached to said flange for freely pivoting motion, said hook being disposed such that, when said roof rests on said upper faces, said first hook hangs by gravity and hooks under said latch bar in said clearance, said first hook comprising means for preventing said ear from disengaging from said latch bar during said inversion,

further comprising a second latch of identical configuration to said first latch mounted on the upper face of the other lateral side of said container and on the opposite lateral side of said roof, said second latch comprising means for performing the recited functions of said first latch when said container is inverted in a second direction, said first hook and the hook of said second latch being weighted such that, during inversion in either said first or said second direction, the lower-most hook will pivot by gravity away from its associated latch bar, thereby freeing said roof to pivot.

4,613,175
LOCKING DEVICE FOR CLOSURES
Bascom M. Nelson, P.O. Box 241, Beeville, Tex. 78102
Filed Feb. 13, 1984, Ser. No. 579,609
Int. Cl.[4] E05C *1/04*
U.S. Cl. 292—148 **9 Claims**



1. A locking device comprising

a housing having a plurality of openings therein;

a mechanism mounted for movement in the housing having

a bolt at one end of the mechanism extending out of the housing through one of the openings,

a handle at a second end of the mechanism extending out of the housing through another of the openings for advancing and retracting the bolt, and

a structure interconnecting the first and second ends for selectively blocking and unblocking movement of the

bolt in response to a padlock body being appropriately located in the housing,

the mechanism being mounted for movement in a plane and two of the housing openings being aligned on an axis perpendicular to the plane;

a support in the housing comprising a fastener extending through the openings perpendicular to the plane for securing the housing to a support; and

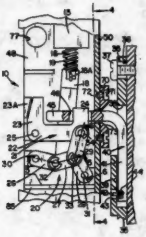
a padlock having a shackle supportably received on the fastener and a body at least partially in the housing located in blocking relation with the structure in a locked position of the padlock and movable to an unblocking position allowing movement of the structure in response to unlocking movement of the padlock, the padlock body being accessible through one of the housing openings.

4,613,176

DOOR LATCH MECHANISM

Michael A. Kelly, Felton, Pa., assignor to Reliable Security Systems, Inc., Cockeysville, Md.

Filed Jun. 29, 1983, Ser. No. 508,874
Int. Cl.[4] E05C *3/00*
U.S. Cl. 292—201 **1 Claim**



1. A compact solenoid-retained door latch mechanism operative between a door and a frame and having a latched and an unlatched position, said mechanism comprising a housing means and a keeper means, one of said means being mounted on the door and the other of said means being mounted on the frame, the housing means including a base, a lid and a channel-shaped cover overlying the base and lid and having a recess therein, the base and lid having cooperating first, second and third bosses therein, respectively, first, second and third pivot pins mounted in said bosses, respectively, a four-bar pivoted toggle linkage at one end of the housing and including only first, second, third and fourth links, respectively, each of which links has one and other ends, respectively, each of the links comprising a single rigid unitary member, means pivotably mounting the one end of the first link on the second pin, means pivotably mounting the one end of the third link on the third pin, means pivotably connecting the other end of the first link to the one end of the second link, means pivotably connecting the other end of the second link to the other end of the third link, a solenoid mounted on the base at the other end of the housing, the solenoid having an armature, resilient means constantly urging the armature outwardly of the solenoid, a substantially C-shaped latch disposed between the toggle linkage and the solenoid, the latch having a cross member, a short leg and a parallel long leg, means pivotably mounting the latch between the cross member and the longer leg thereof on the first pin, means pivotably connecting the other end of the fourth link to the other end of the second link and to the other end of the third link, respectively, means pivotably connecting the one end of the fourth link to the latch between the cross member and the shorter leg thereof, wherein the ends of the fourth link have respective pivot axes, and wherein the fourth link comprises a substantially flat member pivoting in a plane transverse to said pivot axes, keeper means extending through the recess in the cover and cooperating with the shorter leg of the latch in a latched position of the mechanism, an operating stem having one end thereof pivotably mounted on the armature and the other end thereof pivotably connected between the first and second links, respectively, the operating stem being disposed substantially transversely of the cross member of the latch, wherein the first and second links are in an under-the-center arrangement in a direction away from the solenoid, whereby the solenoid exerts a relatively-small holding force on the mechanism, whereby the toggle linkage amplifies the holding force of the solenoid, and whereby when the solenoid is de-energized and pressure is subsequently exerted on the door to move it away from the frame, the force on the mechanism exerted via the door and supplemented by the resilient means, causes the toggle linkage to collapse and the latch to pivot about the first pin, whereby the keeper means is thereby released from the latch, the mechanism moves from its latched to an unlatched position, and the door may be opened for access thereto,

wherein the housing means is mounted on the frame, and the keeper means is mounted on the door,

wherein the keeper means comprises a right-angularly bent keeper bar having a pair of legs, one of the legs having a recess formed therein for receiving the shorter leg of the latch in the latched position of the mechanism, receptacle means carried by the cover for guiding the said one leg of the keeper bar into engagement with the latch, said receptacle means comprising a receptacle member having a substantially rectangular opening formed therein, said opening being provided with tapered sides, and means for trapping the other leg of the keeper bar on the door,

and wherein the means for trapping the other leg of the keeper bar on the door comprises a plate having a central slot formed therein, a boss formed integrally with the plate and overlying a portion of the slot, whereby the other leg of the keeper bar is trapped in the slot between the boss and the door, and means for allowing the said other leg to shift slightly in both horizontal and vertical directions in the plane of the slot continuously during the operation of said door latch mechanism.

4,613,177

VEHICLE BUMPER

Norman S. Loren, Warren, and William E. Gordon, Sterling Heights, both of Mich., assignors to Michael Ladney, Jr., Sterling Heights, Mich.

Division of Ser. No. 624,202, Jun. 25, 1984, which is a continuation-in-part of Ser. No. 568,215, Dec. 30, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,436
Int. Cl.[4] B60R *19/08*
U.S. Cl. 293—120 **11 Claims**

1. A vehicle bumper, comprising:

a fascia having a front portion adapted to receive impact forces and upper and lower flanges extending rearwardly from said front portion;

a backing member positioned rearwardly of the front portion of the fascia and extending verically relative to said upper and lower flanges, said member including means for mounting the bumper on the vehicle;

a resiliently compressible plastic foam molded in situ in at least the volume enclosed by the backing member and the fascia, said foam having an integral skin bonded generally

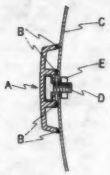
to the interior surfaces of the enclosed volume, but unbonded proximate the joinder of said backing plate and flanges, thereby allowing the bumper to respond to an impact to the fascia by controlled separation of the backing plate and flanges to permit flow therethrough of the resiliently compressible plastic foam.

4,613,178

SIDE MOLD FOR AN AUTOMOBILE

Tamio Fujita, Akashi, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1985, Ser. No. 693,941
Claims priority, application Japan, Jan. 26, 1984, 59-9778[U]
Int. Cl.[4] B60R *19/42*
U.S. Cl. 293—128 **2 Claims**



1. A side mold for an automobile comprising (A) a hard mold portion forming an outside main portion and (B) a soft mold portion forming an inner portion to be contacted with a side of the automobile body; the hard mold portion (A) being made of a blend of (1) 80 to 40 parts by weight of a vinyl chloride polymer and (2) 20 to 60 parts by weight of an ABS resin; said ABS resin comprising

(i) a copolymer of 30 to 80% by weight of α-methyl-styrene, 0 to 30% by weight of styrene, 10 to 30% by weight of acrylonitrile and 0 to 30% by weight of methyl methacrylate, and

(ii) a graft polymer in which at least one component of said copolymer (i) is graft-polymerized onto a butadiene rubber;

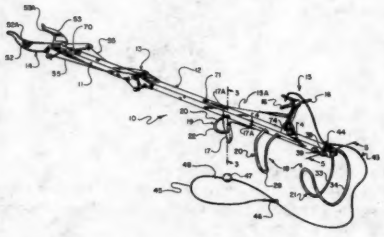
the soft mold portion (B) being made of a plasticized polyvinyl chloride and having a JIS-A hardness of 50° to 90°.

4,613,179

HAND-HELD GRIPPING DEVICE WITH IMPROVED SUPPORT FOR HANDICAPPED PERSONS HAVING LIMITED FINGER FUNCTION OR WRIST STRENGTH

Willem D. van Zelm, 1005 Boyce Ave., Towson, Md. 21204

Filed Feb. 13, 1985, Ser. No. 701,235
Int. Cl.[4] B25J *1/02*
U.S. Cl. 294—19.1 **19 Claims**



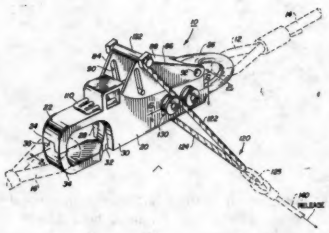
1. A gripping device to aid handicapped persons in reaching and picking up objects, wherein the device substantially satisfies the needs of handicapped persons with minimal or no finger function, severe wrist deformities, and little or minimally functional trunk musculature, the device including a forward arm member carrying a gripping means forwardly thereon, a rearward arm member having a right side and a left side pivotally connected to the forward arm member, a control mechanism for selectively controlling the gripping means, a palm brace secured to the rearward arm member and depending therefrom and a bracing means for providing a three-point lateral restraint system, said bracing means comprising a wrist brace mounted on the rearward arm member rearwardly of the palm brace and positioned proximally to the wrist of the user when the palm brace is pressed by the palm of the user, the wrist brace being devoid of a rigid connection to the wrist of the handicapped person, whereby the wrist brace substantially immobilizes the wrist against either non-functional flexion or extension, a thumb support mounted in juxtaposition to the palm brace and having an opening adapted to receive the thumb of the user when the palm brace is pressed, wherein the sole purpose of the thumb support is to provide a vertical restraint preventing the wrist from dropping downwardly, and an arm support carried on the device rearwardly of the wrist brace.

4,613,180

QUICK-RELEASE DEVICE

Ralph D. Pope, P.O. Box 386, Quemado, N. Mex. 87829

Filed Dec. 17, 1984, Ser. No. 682,531
Int. Cl.[4] B66C *1/36*
U.S. Cl. 294—82.34 **5 Claims**



1. A quick-release device comprising:

(a) a first body member having a first jaw member;

(b) a second body member having a second jaw member engageable with said first jaw member, said first and second body members being pivotally connected at a position longitudinally spaced from said jaw members whereby at least one of said jaw members is pivotal;

(c) a keeper associated with one of said body members;

(d) a locking pin disposed generally parallel to the longitudinal axis of said body members and reciprocal between a first position engaging said keeper and a second position out of engagement with said keeper, wherein said locking pin includes an associated guide member disposed generally parallel to said pin, said pin and guide member being reciprocable within guide bores defined by one of said body members; and

(e) a cam means pivotally mounted on one of said body members moveable to selectively actuate said locking pin between said first and second positions.

4,613,181

COVER ASSEMBLY FOR PICKUP TRUCK BED

Hassan Rafi-Zadeh, 5301 E. Mockingbird La., Paradise Valley, Ariz. 85253

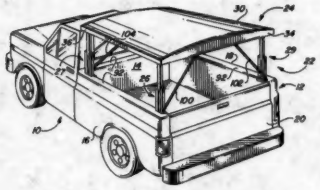
Filed Nov. 25, 1985, Ser. No. 801,288
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—100 **7 Claims**

1. A vertically extensible cover assembly for use on the bed of a pickup truck comprising in combination:

(a) a rigid cover of rectangular configuration;

(b) four folding arms each dependingly mounted at a different one of the corners of said cover;

(c) four separate one piece mounting brackets each pivotably mounted on the lower end of different ones of said folding arms for attachment to the upper ledges of the pickup truck bed at different corners thereof, said mounting brackets being selectively mounted on their respective ones of said folding arms in a first position wherein they are disposed for being mounted in an overlaying position on the ledges of the pickup truck bed when the ledges are relatively wide, and in a reversed second position wherein they are disposed for being mounted in an inwardly extending position on the ledges of pickup truck beds when the ledges are relatively narrow;



(d) each of said folding arms having a folded position wherein said cover is in a lowered position on the pickup bed when said mounting brackets are mounted thereon and having an unfolded extending position wherein said cover is elevated relative to the pickup truck bed when said mounting brackets are mounted thereon; and

(e) transverse stabilizing means connected between the lower ends of said folding arms and the front and rear depending panels of said cover for stabilizing the cover in its elevated position against lateral displacement relative to the longitudinal dimension of the pickup truck when said mounting brackets are mounted on the bed thereof.

4,613,182

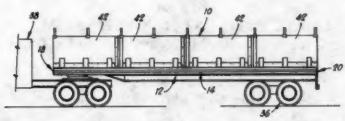
SIDE PANEL ASSEMBLY

Jack C. Stone, Box 53, Marlow, Okla. 73055

Filed Aug. 27, 1984, Ser. No. 644,346

Int. Cl.[4] B62D *27/00*

U.S. Cl. 296—181 **12 Claims**



1. A side panel assembly adapted for connection to a trailer having opposite sides, opposite ends, a trailer floor and a pair of side support beams with each side support beam extending generally along one side of the trailer, comprising:

a side panel having an upper end, a lower end and opposite sides, the side panel being positionable in an upright position generally near one side of the trailer with the lower end of the side panel being disposed generally near the trailer floor and the side panel extending a distance upwardly from the trailer floor terminating with the upper end of the side panel and the side panel extending a distance generally along at least a portion of one side of the trailer in the upright position of the side panel and at least one hinge opening extending through the side panel intersecting a front wall and a back wall of the side panel; and

at least one hinge assembly, each hinge assembly having a pivot end pivotally connected to the side panel and an opposite connecting end connectable to one of the side support beams in an upright position of the side panel, the connecting end of the hinge assembly being removably connected to a portion of one of the side support beams in an upright position of the side panel and substantially preventing movement of the side panel in a direction generally away from the trailer floor in an upright position of the side panel with the connecting end of the hinge assembly removably connected to a portion of one of the side support beams;

a hinge plate connected to the front wall of the side panel, each hinge plate convering a substantial portion of one of the hinge openings in the side panel;

a pair of hige supports connected to the hinge plates and disposed generally within one of the hinge openings in the side panel, the hinge supports being spaced a distance apart and each hinge support including an opening extending a distance therethough;

a hinge shaft, each hinge shaft extending between the pair of hinge supports and each hinge shaft including opposite end portions with one end portion being journally supported in the opening in one of the hinge supports and an opposite end portion being journally supported in the other hinge support; and

a hinge member having one end secured to the hinge shaft forming the pivot end and an opposite end of the hinge member forming the connecting end.

4,613,183

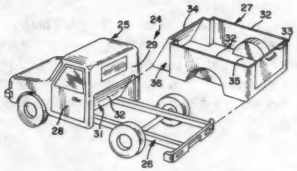
CAB AND BOX CONSTRUCTION FOR PICKUP TRUCK

Peter C. Kesling, Green Acres, LaPorte, Ind. 46350

Filed Sep. 27, 1982, Ser. No. 423,858

Int. Cl.[4] B60P *9/00*

U.S. Cl. 296—183 **8 Claims**

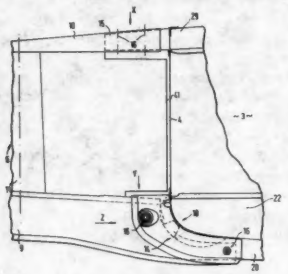


5. A pickup truck having a cab and a separate open box, said cab having at least opposed walls with doors, a substantially vertical rear wall and a seat therein for the driver or a driver and a passenger, said seat including a generally horizontal seat cushion and an upstanding seat back, said box having substantially vertical opposed side and opposed front and rear end walls upstanding from a bottom wall or floor defining an open top and said front end wall being immediately behind said cab rear wall, a forwardly projecting lower cab rear wall portion and a portion of said box front end wall at the floor generally mating with said forwardly projecting portion and extending ahead of said substantially vertical rear wall and at least under a portion of the seat for increasing the box length, without increasing the entire length of the truck, to a length greater than the horizontal distance from the substantially vertical rear wall of the cab to a vertical plane passing through the rear end wall of the box, said portion extending across substantially the entire width of said box.

4,613,184
BODY STRUCTURE FOR MOTOR VEHICLES, ESPECIALLY PASSENGER MOTOR VEHICLES

Siegfried Rispeter, Besigheim, and Diethelm Schneider, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,814
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223156
Int. Cl.[4] B60R *21/00*
U.S. Cl. 296—187 22 Claims



1. A body structure for a motor vehicle comprising an end unit having a support structure formed of transverse and longitudinal support means and a passenger cell having a support structure including longitudinally extending supports, a boundary wall separating the passenger cell from the end unit, upper and lower hollow mounting means associated with said boundary wall for axial aligning upper and lower longitudinal support means of the end unit with respective upper and lower longitudinally extending supports of the passenger cell, said upper longitudinal support means including a bifurcated portion and said upper mounting means including means for detachably securing the respectively aligned upper longitudinal support means and upper longitudinally extending support, said lower mounting means including a reinforcing part and means for detachably securing the respectively aligned lower longitudinal support means and lower longitudinally extending support, whereby said end unit is mounted by said mounting means in a manner so that the upper and lower longitudinal support means generally form a continuation of the respective upper and lower longitudinally extending supports of the passenger cell.

4,613,185
FOLDING CHAIR

Sisto Marchesini, Montecchio Maggiore, Italy, assignor to ICU Intercommerz Union S.A., Riva San Vitale, Switzerland

Filed Aug. 15, 1984, Ser. No. 641,181
Claims priority, application Italy, Aug. 17, 1984, 22630/83[U]
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—39 11 Claims

1. A folding chair movable from a folded, collapsed position, to an unfolded, open position, said chair comprising:

(a) chair seat means having a front portion, a rear portion, and opposed side portions;

(b) backrest means having a top portion, a bottom portion, and opposed side portions;

(c) connection means extending between the rear portion of said seat means and the bottom portion of said backrest means for pivotally connecting the rear portion of said seat means with the lower portion of said backrest means;

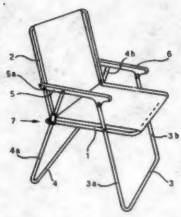
(d) a pair of front legs pivotally carried by respective opposite side portions of said seat means;

(e) armrest means extending between and connnecting said front legs to respective opposite side portions of said backrest means;

(f) a pair of rear legs pivotally connected with said armrest means at a point between said backrest means and said front legs;

(g) lever means pivotally extending between and connecting respective ones of said rear legs and said side portions of said backrest means; and

(h) cooperable retaining means including a detect and a recess and carried by opposed, relatively slidable surfaces of respective ones of said connection means and said lever means, to releasably maintain said lever means and said connection means in a predetermined relative orientation to maintain said chair in an open, unfolded condition, said detent engaged with said recess when said chair is in the

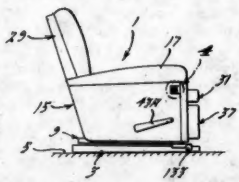


open, unfolded condition and disengaged therefrom when the elements of said chair are pivoted relative to each other to move the chair toward a closed condition, in which the retaining means include a first retaining element in the form of a cam surface defining a ramp progressively increasing in height and terminating in a recess, said cam surface positioned on one of said connection means and said lever means, and a detent on the other of said connection means and said lever means, said cam and said detent being in radial correspondence relative to a circle concentric to a pivot between the connection means and the lever means, the detent being engageable with said recess in the open condition of the chair to provide stability to said chair when in the open condition and prevent unintended folding thereof.

4,613,186
CHAIR WITH LATCH MECHANISM

Larry P. LaPointe, LaSalle, Mich., assignor to La-Z-Boy Chair Company, Monroe, Mich.

Filed Nov. 21, 1984, Ser. No. 673,877
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—83 6 Claims



1. In a chair, a stationary base frame, a second frame mounted on the base frame for longitudinal fore and aft movement between a forwardmost position and a rearmost position, a chair body having sides and carried by said second frame to move longitudinally with it, a forward toothed latch bracket, a rear toothed latch bracket, said brackets being mounted on said base frame and located to determine respectively said forward-

most and rearmost positions, a movable pawl pivotally mounted on the second of said frames on a horizontal axis and yieldably biased by gravity to operatively engage the teeth in said brackets, and manual means for moving the pawl to disengage it from said brackets, said manual means including a mechanical actuator switch mounted on said body adjacent the top of one of said sides and operable to actuate the pawl.

4,613,187

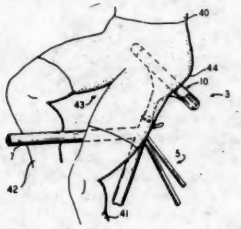
BICYCLE AND STATIONARY SEATS

James F. Gordon, 1276 Flying Bridge La., Osprey, Fla. 33559

Continuation-in-part of Ser. No. 748,481, Jun. 25, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,152

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—195 **30 Claims**



1. A bicycle seat for accommodating a rider comprising:

a cylindrical seat bar having

a rigid tubular member extending substantially the entire width of the seat;

a resilient material of pre-determined thickness concentrically surrounding said tubular member; and

a relatively thin cover of durable material concentrically surrounding said resilient material; and

a tubular seat post of pre-determined length substantially perpendicularly oriented to said seat bar and downwardly extending from the center of said bar;

wherein the seat bar is mounted to the bicycle in a direction substantially tranverse to the frame of the bicycle so that the seat bar abuts against and spans the entire width of the rider's buttocks and does not contact the crotch of the rider whenever the rider sits on the bicycle.

4,613,188

CHILD RESTRAINING DEVICE

Hiroshi Tsuge; Akinori Fujiwara; Hiroki Iwasa; Chikao Nagasaka, and Tsutomu Muraoka, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-rika-denki-seisakusho, Aichi, Japan

Filed Dec. 18, 1984, Ser. No. 683,234

Claims priority, application Japan, Dec. 19, 1983, 58-195150[U]

Int. Cl.[4] A47C *1/08*

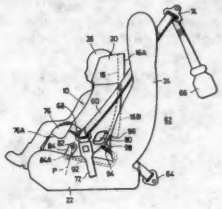
U.S. Cl. 297—250 **17 Claims**

1. A child restraining device for restraining a child occupant of a vehicle, which comprises:

(a) a child receiving vessel secured on a seat of the vehicle by a webbing of the vehicle;

(b) child restraining means for restraining the child occupant on the vessel; and

(c) a reclining mechanism including a supporting member for supporting the vessel on the seat, the supporting member being provided with a pair of distal end portions, each of which is rotatably supported on a crank means, and a rear portion serving to abut the seat in a supporting relationship, the two crank means including a pair of crank levers connected to each other by a rod and rotatably



supported by pins provided on either side of the vessel, whereby the vessel can be reclined readily.

4,613,189

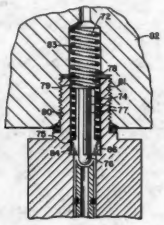
VALVE ASSEMBLY FOR USE IN BRAKE PRESSURE CONTROL UNIT

William A. Barr, Gibson Island, Md. 21056

Filed Oct. 12, 1984, Ser. No. 659,897

Int. Cl.[4] B60T *8/26*

U.S. Cl. 303—6 C **4 Claims**



1. In a brake pressure control unit for a vehicle brake system which unit includes an inlet adapted to be connected to a master cylinder and an outlet adapted to be connected to a wheel brake cylinder, said unit having a stepped bore, a stepped piston in said bore and including an axial passage communicating with said inlet and said outlet, a valve chamber in said unit between one end of said stepped bore and said inlet, a valve seat co-axial with said passage in said stepped piston and at the end thereof adjacent said valve chamber, and a valve extending towards said bore from said chamber for engagement by said valve seat to close said passage upon movement of said stepped piston towards said valve in response to opposing pressure forces acting on said piston, said valve having a cross-sectional dimension less than said bore, the invention comprising means for retaining said valve at all times co-axial with said valve seat, said means comprising an assembly co-axially received in said valve chamber and supporting said valve, said valve chamber having a cylindrical internal wall surface and said assembly including means defining in cross-section an external cylindrical surface in close sliding engagement with the internal wall surface of said valve chamber, said engaged cylindrical surfaces having an axial extent sufficient to prevent positively said assembly and hence said valve from moving laterally or cocking with respect to the axis of said valve seat during sliding movement of said body assembly, axially extending fluid passage means enabling the flow of fluid between said inlet and outlet through said chamber when said valve is disengaged from said valve seat, stop means between said bore and said chamber engageable by said assembly to limit the movement of said valve towards said bore, and resilient means biasing said assembly towards said stop means said assembly including a part integral with said valve and extending co-axi-

ally into said valve chamber, said extending part having along its length a plurality of substantially opposed surfaces spaced an equal distance radially inwardly from the cylindrical side wall of said chamber, and the means defining the external cylindrical surface comprises a sleeve-like element having wall thickness substantially equal to the spacing between said substantially opposed surfaces and said chamber wall and being located co-axially over said extending part.

4,613,190

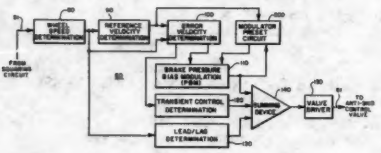
MODULATOR PRESET CIRCUIT

Stuart E. Johnson, Montrose, Calif., assignor to Crane Co., Chicago, Ill.

Filed Apr. 10, 1984, Ser. No. 598,839

Int. Cl.[4] B60T *8/68*

U.S. Cl. 303—109 **18 Claims**



1. In a vehicle antiskid brake control system for controlling the braking action on a braked wheel; said system comprising modulator means for generating a modulated antiskid brake control signal as a time integral function of a signal indicative of a braking condition of the braked wheel, wherein the magnitude of the antiskid brake control signal is indicative of a desired level of progressive reduction of the maximum available braking action to reduce skidding of the braked wheel; and valve means, responsive to the antiskid brake control signal, for limiting braking of the braked wheel by an amount which varies progressively in accordance with the magnitude of the antiskid brake control signal; the improvement comprising:

means for presetting the modulator means to preset the magnitude of the antiskid brake control signal to a preset value indicative of a desired partial reduction of the maximum available braking action; and

means, included in the presetting means, for enabling the presetting means at the start of a braking period, regardless of skid activity of the braked wheel.

4,613,191

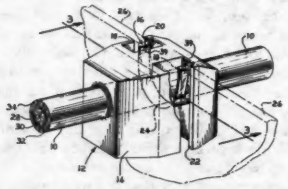
GROUNDING CONNECTOR

Ralph A. Papa, Harrisburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1985, Ser. No. 723,525

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—14 R **5 Claims**



1. A grounding connector for a cable having a layer of insulation over a conductive shield, said connector comprising a conductive element contacting said shield in a stripped length of said cable and a dielectric housing encasing said stripped length,

said element having an integral arm projecting therefrom and through said housing for contact with a conductive panel, said housing being a bushing provided with a slot for mounting the connector on an edge of said panel and said arm being bent for yielding contact with said edge.

4,613,192

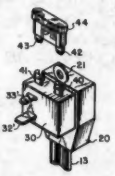
POWER CORD STRAIN RELIEF

Donald E. Peterson, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Continuation-in-part of Ser. No. 570,791, Jan. 16, 1984, abandoned. This application Jul. 1, 1985, Ser. No. 750,919

Int. Cl.[4] H01R *4/66, 13/56*

U.S. Cl. 339—14 P **17 Claims**



10. A strain relief for a power cord of an electric device, wherein the power cord has at least three leads, the first of which is adapted to be grounded; said strain relief comprising an insulating body, said power cord extending into one end of said insulating body, a grounding lug extending from the end of said body opposite one end, and connected internally of said body to said first lead of said power cord, first and second parallel grooves in opposite sides of said body extending between said ends and in a plane parallel to and adjacent to the plane of said ground lug, said body having a first portion into which said power cord extends and from which said grounding lug extends, and a second portion on the side of said grooves opposite said first portion, and first and second connector means on said second portion of said body, at least said first connector means being connected to another lead of said power cord.

4,613,193

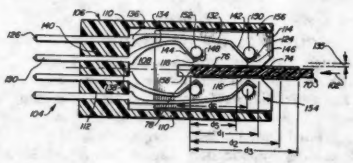
BOARD-OPERATED ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

Howard L. Beers, Cape Coral, Fla., assignor to Tritec, Inc., Naperville, Ill.

Filed Aug. 13, 1984, Ser. No. 639,832

Int. Cl.[4] H01R *13/629*

U.S. Cl. 339—17 L **34 Claims**



1. A board-operated connector for connecting a pair of spaced printed terminals located on a printed circuit board with a pair of corresponding output leads carried by said connector in order to connect the terminals with other parts of the electrical system with which the printed circuit board is used, said pair of printed terminals being arranged in a column oriented transverse to a first edge of said circuit board, the first of said terminals lying farther than the second terminal from said board edge with its boundary that is nearest said edge located at a first predetermined distance from the edge, with its geometric center lying a second predetermined distance from said board edge, and with its boundary that is most remote from said edge lying a third predetermined distance from the edge,

the geometric centers of said printed terminals being spaced from each other by a fourth predetermined distance, said second printed terminal lying with its boundary that is most remote from said edge at a fifth predetermined distance from the board edge, which connector comprises:

(a) a pair of output leads;

(b) first and second contacts, each of said contacts having:

(i) a free end associated with a predetermined one of said printed terminals and electrically connected with a predetermined one of said output leads,

(ii) an open position, and

(iii) a closed position for contact with its said associated printed terminal;

(c) a narrow hollow body formed of rigid, insulative material for housing said contacts and for carrying said output leads fixedly attached to said connector body and extending outward therefrom, said body having a median plane and two main walls parallel to said plane which are connected by two narrow walls, said walls together defining the interior of said connector body and defining an opening for receiving said printed circuit board,

said circuit board when inserted by the user of the container in said board-receiving opening being guided through a predetermined path into a operative position within the interior of said body in which position said board is disposed generally parallel to said main walls, said first edge of the circuit board moving past said first and second contacts as the board moves through its said predetermined path,

said two contacts being arranged in a column transverse to said board-receiving opening with said first contact positioned nearer to said opening, the geometric centers of said two contacts being spaced from each other by a distance substantially equal to the aforesaid fourth predetermined distance;

(d) resiliently deformable, elongated support means for each of said first and second contacts, each of said support means:

(i) normally supporting its respective contact in the contact's open position, and

(ii) being insulated, together with its associated contact, from the other of said two contacts and the latter's associated support means;

(e) actuator means for each of said resiliently deformable support means, each of said actuator means being positioned to deform the support means with which it is associated to urge its respective contact, in a direction generally normal to said median plane, into its said closed position; and

(f) means for operating both said actuator means in automatic response to the insertion of the printed circuit board in said board-receiving opening and movement of the board along said predetermined path, said means for operating said actuator means comprising movable carriage means positioned alongside said pair of elongated support means and supporting at least one of said actuator means, at least one of said actuator means comprising a rigid pin formed of insulative material extending perpendicularly from said carriage means in a direction transverse to its associated elongated support means, said carriage means:

lying entirely outside said predetermined path followed by said printed circuit board, when it is inserted in said connector body and is moved along said path, at least until the board first reaches a safe position, and

as the board is moved farther along said predetermined path into its said operative position, being pushed by said board to cause said at least one actuator means supported on said carriage means to press its associated contact toward its fully closed position,

said carriage means operating said actuator means only after the printed circuit board has been moved, while said first contact is held by its said support means in its normal open position, to said safe position within the interior of said connector body, in which position said first edge of the circuit board has moved along said predetermined path of the circuit board beyond said first contact a distance greater than the aforesaid fifth predetermined distance, but less than said first predetermined distance, to bring said first contact to a position between said first and second terminals,

said carriage means, in automatic response to insertion of said printed circuit board in said board-receiving opening and movement of the board along its said predetermined path to an initial contacting position, in which position said first edge of the circuit board has moved beyond said first contact a distance greater than the aforesaid first predetermined distance, but less than said third predetermined distance, causing said actuator means to move said contacts into contact with their respective printed terminals on the printed circuit board,

whereby all contact between said first contact and said second printed terminal is avoided from the time the printed circuit board is inserted within the connector at least until it reaches its said safe position, and

whereby said contacts are brought into initial contact with their respective printed terminals on the printed circuit board only after the board has been inserted in said connector body to its said initial contacting position, and into full pressure contact with said printed terminals only after the circuit board has been moved into its fully operative position within the connector body.

4,613,194

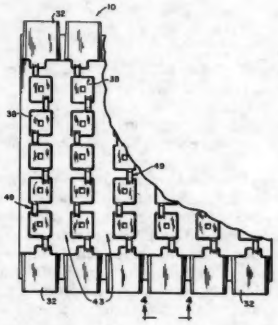
MULTIPLE ELECTRICAL CONNECTOR AND STAGGERED MOUNTING BLOCK

Karl-Heinz Pohl, Buffalo, Minn., assignor to The Siemon Company, Watertown, Conn.

Filed Sep. 29, 1983, Ser. No. 537,065

Int. Cl.[4] **H01R** *9/00, 31/08*

U.S. Cl. 339—19 **11 Claims**



1. A block which houses a plurality of individual looped connector elements formed from electrically conductive stock of circular cross-section, the block including:

a retainer section;

a plurality of spaced slots arranged in rows in said retainer section, each of said retainer rows being formed of two retainer subrows with alternating ones of said retainer slots comprising each retainer subrow to form a zigzag configuration of said retainer slots in each of said retainer rows, adjacent ones of said retainer slots in each of said retainer rows overlapping one another;

a main body section;

a plurality of a spaced slots arranged in rows in said main body section, each of said main body rows being formed of two main body subrows with alternating ones of said main body slots comprising each main body subrow to form a zigzag configuration of said main body slots in each of said main body rows, adjacent ones of said main body

slots in each of said main body rows overlapping one another;

a plurality of bridge elements on said main body section, said bridge elements each being in alignment with pairs of said overlapping slots in said main body section, each bridge element defining a pair of overlapping passages in registration with said main body section;

corresponding retainer slots, main body section slots and bridge element passages cooperating to define housings for a plurality of said individual looped connector elements of the type formed from electrically conductive stock of circular cross-section which are in said block;

means which electrically interconnect adjacent overlapping ones of said individual looped connector elements in each of said rows;

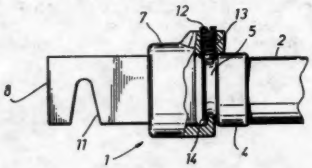
and means which join said retainer section to said main body section.

4,613,195

CARTRIDGE FUSE TERMINAL ADAPTER

Frank Suher, Chesterfield, Mo.; Glen Dunn, Fairview, N.C.; Vernon Spaunhorst, Washington, and Angelo Urani, St. Louis, both of Mo., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 14, 1985, Ser. No. 711,527
Int. Cl.[4] H01R *13/35*
U.S. Cl. 339—31 R **15 Claims**



1. For a fuse adapted to be secured in a first rejection fuse holder including a notched fuse terminal having a first notched portion sized to receive a first projecting portion within the fuse holder, an adapter for coupling the fuse to a second rejection fuse holder having a second projecting portion, comprising:

a body having inner and outer ends;

a receiver portion formed in the inner end of the body sized to receive the notched fuse terminal, said receiving portion including a third projecting portion sized to prevent the installation of an unnotched fuse terminal within the receiver portion while accommodating the installation of the notched fuse terminal within the receiver portion with the third projecting portion engaged within the first notched portion;

clamping means adapted to secure the notched fuse terminal within the receiver portion; and

a second notched portion in the outer end of the body sized to receive the second projecting portion to accommodate coupling the adaptor to the second rejection fuse holder.

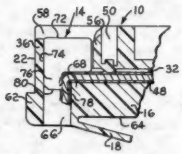
4,613,196

TELEPHONE CORD TERMINATING PLUG

Gerhard Foerster, Woodbridge, Conn., assignor to Jane G. Montgomery, Woodbridge, Conn.

Filed May 13, 1983, Ser. No. 494,542
Int. Cl.[4] H01R *11/20*
U.S. Cl. 339—97 P **11 Claims**

1. In an electrical connector for terminating an unmated free end portion of a single low current multi-wire electrical cord without the necessity for altering the length of the cord comprising a one piece dielectric housing having a central wire receiving aperture, a front wall forming a barrier at one end of the aperture, a plurality of terminal receiving slots extending between the aperture and a first exterior surface of the connector, the aperture at each slot being of a size sufficient to receive only a single wire of the multi-wire cord and individual plate-like terminals positioned within the slots for movement toward the aperture, the combination comprising an interior front wall surface having a first planar portion between the aperture and said first exterior surface defining said terminal receiving slot and a second planar portion between the aperture and a second exterior surface opposite said first exterior surface a wall structure spaced from said second planar portion and defining therewith a recess associated with each slot and extending from said aperture toward the said second exterior surface of the connector opposite said first exterior surface to provide a generally L-shaped wire-receiving cavity for receiving the free end portion of the multi-wire cord, said first and second planar portions being coplanar, said plate-like terminals being mov-



able along said interior front wall surface from said slots toward said opposite exterior surface and having a wire engaging portion adapted to pass through the longitudinal plane of said aperture and into said recess for bending the free end portion of the wire out of the plane of said aperture and into said recess, said plate-like terminal having an elongated stabilizing front edge that bears against both said first and second planar wall surface portions and an opposite elongated edge that cuts through an insulative covering on the wire as the wire is bent into said recess whereby said wire is engageably retained between said wire engaging portion and said wall structure without significantly altering the length thereof, said wire engaging portion including means for making electrical contact with said wire along said opposite elongated edge as said stabilizing front edge bears against both said first and second planar portions of said front wall to maintain said electrical contact.

4,613,197

RAPID ASSEMBLY ELECTRICAL PLUG

Ronald G. Munroe, Staten Island, and Gregory E. Moreinis, Forest Hills, both of N.Y., assignors to Eagle Electric Mfg. Co., Inc., Long Island City, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,712
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—99 R **18 Claims**

1. An electrical connector comprising

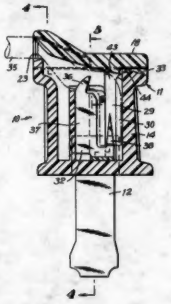
a housing of an electrically insulating material bounding an input opening and a receiving channel for an end portion of an electrical cord having at least two electrical conductors surrounded by respective insulating jacket portions;

at least two electrical contact elements mounted in position in said housing and operative for establishing electrical contacts with their respective counterparts; and

means for establishing electrical connections between the respective electrical conductors of said electrical cord and the associated electrical contact elements, including

end penetrating elements electrically connected to the respective electrical contact elements and mounted in said housing at such locations as to project into said receiving channel and penetrate into the respective electrical conductors in the longitudinal direction of said cord during the introduction of the end portion of said cord into said receiving channel, and

side penetrating elements also electrically connected to the respective electrical contact elements and so mounted in and positioned with respect to said housing as to penetrate



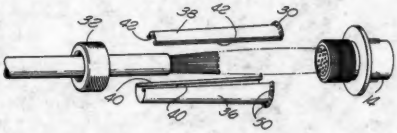
through said jacket portions of said cord and into electrical contact with the respective electrical conductors in said input opening and substantially transversely of said cord.

4,613,198

ELECTRICAL CONNECTOR BACKSHELL

Gerald J. Selvin, Huntington Beach, and Hermenegildo A. Espiritu, Cerritos, both of Calif., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,819
Int. Cl.[4] H01R *13/46*
U.S. Cl. 339—141 **11 Claims**



1. A backshell adapted to be mounted onto a connector shell which may contain contacts connected to the conductors of a cable comprising:

a hollow backshell housing adapted to receive said cable therethrough;

said housing being divided longitudinally into a pair of separable parts providing two sets of adjacent longitudinally extending edges, said parts being formed of flexible material;

the edges of each said set embodying interlocking means allowing longitudinal sliding engagement of said parts but preventing lateral separation of said parts even if one or both of said parts is flexed;

said housing having a front adapted to be connected to said connector shell, and a rear;

a hollow elbow removably mounted on the rear of said housing; and

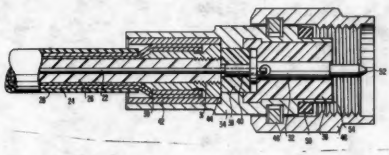
said elbow being divided into separable upper and lower halves.

4,613,199

DIRECT-CRIMP COAXIAL CABLE CONNECTOR

Peter G. McGeary, Hobe Sound, Fla., assignor to Solitron Devices, Inc., Riviera Beach, Fla.

Filed Aug. 20, 1984, Ser. No. 641,992
Int. Cl.[4] H01R *17/18*
U.S. Cl. 339—177 R **9 Claims**



1. A coaxial cable connector having an inner conductor separated from a cable braid of a cable dielectric having a dielectric diameter, the cable braid being encased by a cable jacket having a jacket diameter, said connector comprising:

a tubular main body of a malleable and electrically conductive material, having a first inner diameter larger than the packet diameter of the cable jacket;

insulating means, locatable inside said tubular main body for providing electrical insulation between said tubular main body and the inner conductor of the coaxial cable; and

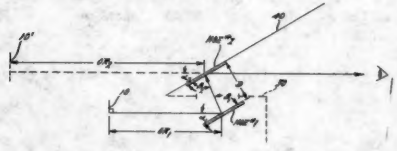
a ferrule, locatable inside said tubular main body, of an electrically conductive material, said ferrule having an axial bore substantially larger than the dielectric diameter of the cable dielectric and an exterior surface with a front end having a maximum outer diameter, a center section with an outer diameter smaller than the maximum outer diameter and a rear end at which the outer diameter of the center section tapers rearwardly toward the axial bore, said connector being attachable to the coaxial cable by inserting said ferrule between the cable braid and the cable dielectric, inserting said insulating means into said tubular main body and sliding said tubular main body over said ferrule and the coaxial cable, then crimping said tubular main body to exert axially directed pressure to hold the cable braid against the front end of said ferrule.

4,613,200

HEADS-UP DISPLAY SYSTEM WITH HOLOGRAPHIC DISPERSION CORRECTING

Nile F. Hartman, Westerville, Ohio, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 9, 1984, Ser. No. 629,160
Int. Cl.[4] G02B *5/32*
U.S. Cl. 350—3.7 **8 Claims**



1. A holographic head up display system comprising:

a source of broad-band radiation generating a visible image;

a first reflective hologram having optical power and positioned to reflectively diffract said image radiation;

a second reflective hologram having optical power and positioned substantially parallel to said first reflective hologram to reflectively diffract said image radiation diffracted from said first hologram towards a viewer, whereby said image appears to said viewer as a virtual image of said source of broad-band radiation superim-

posed on the viewer's direct field of view through the second hologram.

4,613,201

LIGHT PROJECTION APPARATUS

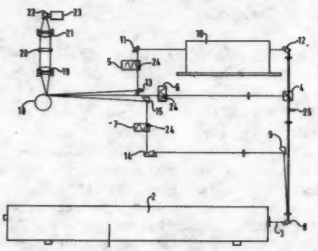
Martin C. Shortle, Huntingdon, and Daniel R. Lobb, Chislehurst, both of England, assignors to Dwight Cavendish Co., Ltd., Cambridgeshire, England

Continuation of Ser. No. 457,960, Jan. 14, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,431

Claims priority, application United Kingdom, Jan. 19, 1982, 8201486

Int. Cl.[4] G02B *26/10, 27/18*

U.S. Cl. 350—6.1 **14 Claims**



1. Light projection apparatus, comprising:

a primary laser light source;

beam splitting means for splitting a light beam from said primary laser light source into first, second and third components, said first component being a blue light beam component, and said second component being a green light beam component;

a dye laser arranged to receive said third component, said dye laser being energized by said third component to produce a red light beam component;

modulating means for modulating said green, blue and red light beam components;

raster scanning means for receiving modulated light from said green, blue and red modulating means and for projecting the light on to a viewing surface.

4,613,202

SUPPORT STRUCTURE FOR ELECTROMECHANICAL TRANSDUCER

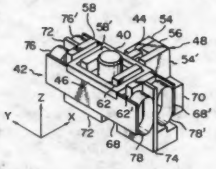
Kazumi Kuriyama, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 625,966

Claims priority, application Japan, Jun. 30, 1983, 58-102434[U]

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.4 **10 Claims**



1. A support structure for an electromechanical transducer assembly including an optical unit and drive means for driving the optical unit in at least two directions consisting of a first direction and a second direction perpendicular to the first direction, comprising

stationary structure means,

movable structure means movable in said two directions from and to a predetermined position with respect to the stationary structure means, said optical unit being movable with the movable structure means, and

at least two spring elements each constituted by an endless band of an elastic or viscoelastic material, each of the spring elements being interposed between the stationary and movable structure means and having a center axis in a third direction perpendicular to both of said first and second directions, each of the spring elements being deformed under compression into a generally oval configuration between said stationary and movable structure means.

4,613,203

SECONDARY MIRROR TILTING DEVICE FOR A REFLECTING TELESCOPE

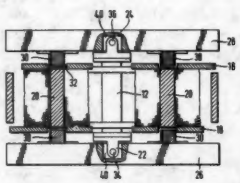
Klaus Proetel, Troisdorf; Alfred Krabbe, Gronau; Klaus Hausecker, Baiertal; Dietrich Lemke, Heidelberg; Heinrich Bellemann, Wiesenbach, and Franz Flock, Walldorf, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften

Filed Apr. 5, 1983, Ser. No. 482,137

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3213076

Int. Cl.[4] G02B *26/08*

U.S. Cl. 350—6.6 **12 Claims**

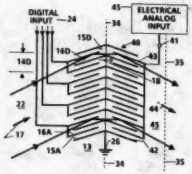


1. A mirror tilting device for a reflecting telescope comprising mirror support means supporting a mirror for oscillation about a first axis, first armature means comprising a pair of armatures carried by the support means on opposite sides of the first axis, compensating plate means supported for oscillation about a second axis which is spaced from and parallel to the first axis, second armature means comprising a pair of armatures carried by the compensating plate means on opposite sides of the second axis, a pair of electromagnetic drive means disposed between the mirror support means and the compensating plate means including a pair of magnetic cores positioned between corresponding armatures of the first and second armature means respectively, the spacing between each magnetic core and an adjacent armature being dependent upon the relative angular position of the mirror support means and the compensating plate means, spring means interposed between the mirror support means and the compensating plate means tending to restore the mirror support means and the compensating plate means to selected angular positions, and means for supplying a substantially constant current alternately to the pair of electromagnetic drive means, wherein the spring means provides a restoring force which increases more rapidly than the force of magnetic attraction resulting from the change in spacing between the magnetic cores and the corresponding armatures as the mirror support means and the compensating plate means approach the selected angular positions.

4,613,204
D/A CONVERSION APPARATUS INCLUDING ELECTROOPTICAL MULTIPLIERS

Carl M. Verber; Thomas B. Smith, and Philip M. Dunson, all of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Nov. 25, 1983, Ser. No. 555,242
Int. Cl.[4] G02B 6/10; G05B 15/08; H03M 1/00
U.S. Cl. 350—96.14 8 Claims



1. Apparatus for receiving electrical input potentials representing respectively the values of components of weighted digital input data, and for providing analog optical output approximately proportional to the sum of the weighted digital values in the input data, comprising

an electrooptic waveguide,

a plurality of adjacent electrooptic diffractive means, each responsive to a separate component of the digital input data and comprising a first electrode and a second electrode on the waveguide for temporarily changing the index of refraction, when different electrical potentials are present thereon, and thus forming a Bragg grating therein positioned with a direction of Bragg incidence approximately in the same predetermined input direction and with a direction of Bragg diffraction approximately in the same predetermined output direction,

light input means for directing light of known or controlled intensity to enter into each diffractive means approximately in the predetermined input direction, and

means for providing an electrical potential to each electrode in each diffractive means, such that the difference between the potential at the first electrode and the potential at the second electrode is substantially zero for each diffractive means responsive to a component of the digital input data having the value of zero, and the difference between the potential at the first electrode and the potential at the second electrode for each diffractive means responsive to a component of the digital input data having a value greater than zero is such as to form a Bragg grating that diffracts in the predetermined output direction a portion of the input light having an intensity approximately proportional to the weighted value of that component of the digital input data,

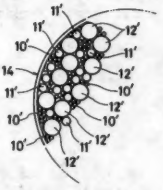
the components of the digital input data being weighted, as in binary computation, proportionally to successive integral powers of two, and

comprising an additional electrooptic diffractive means located to receive the light travelling beyond each of the plurality of first-mentioned diffractive means, and responsive also to electrical input potentials representing values of analog input data; the additional diffractive means comprising a third electrode and a fourth electrode on the waveguide for temporarily changing the index of refraction, when different electrical potentials are present thereon, and thus forming a Bragg grating therein positioned with a direction of Bragg incidence approximately in the predetermined output direction of the plurality of first-mentioned diffractive means and with a direction of Bragg diffraction approximately in a predetermined different output direction; and means for providing one electrical potential to the third electrode and another electrical potential to the fourth electrode, and thereby to direct in the different output direction light having a total intensity that is approximately proportional to the product of the value represented by the digital input data multiplied by the value represented by the analog input data.

4,613,205
IMAGE FIBER AND METHOD OF FABRICATING BASE MATERIAL FOR THE SAME

Shibuya Seiji; Satoh Tuguo; Komatsu Wataru, and Shimuzu Takeo, all of Tokyo, Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,340
Claims priority, application Japan, Aug. 6, 1982, 57-137083
Int. Cl.[4] G02B 6/06
U.S. Cl. 350—96.25 4 Claims



1. A method of making an image fiber base material used to transmit an image, consisting of the steps of

(1) longitudinally assembling in a non-uniform distribution thousands of first and second sets of optical fiber strands, these two sets of strands having a cross-sectional diameter of at least two different sizes, wherein the strands of the first set are of the order of 30% or more of the total number of strands and the difference in diameter between the two sets of strands is of the order of at least 5%;

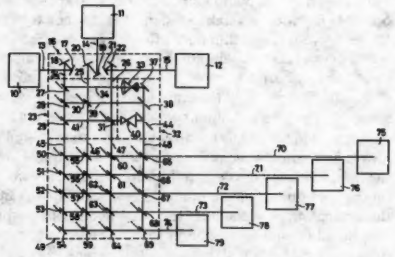
(2) longitudinally inserting the strands into a hollow glass pipe; and,

(3) collapsing the pipe about the strands.

4,613,206
SYSTEM FOR THE FLEXIBLE COMPOSITION OF LASER BEAMS

Ilario Franchetti, S. Vittore Olona; Lino Grisoni, Cantu' ; Luciano Garifo; Giovanni Incerti, both of Milan, and Vincenzo Fantini, Sesto San Giovanni, all of Italy, assignors to Alfa Romeo Auto S.p.A, Napoli and CISE-Centro Informazioni Studi Esperienze S.p.A., Milan, both of, Italy

Filed Sep. 7, 1984, Ser. No. 648,260
Claims priority, application Italy, Dec. 20, 1983, 24272 A/83
Int. Cl.[4] G02B 27/10
U.S. Cl. 350—174 11 Claims



1. A system for the flexible composition of laser beams, comprising at least two laser sources for emitting laser beams and working stations, a decoupling unit constituted by suitable pairs of mirrors disposed at prechosen angles of incidence, a

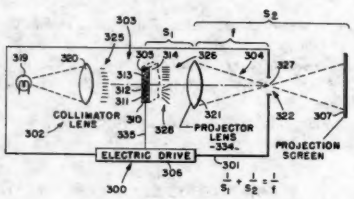
composition unit, and directing units constituted by matrices of mobile mirrors disposed at prechosen angles of incidence, said units being operationally connected to each other, to said laser sources and to the working stations, the system being characterised in that at least one of said laser sources emits a beam of substantially annular cross-section, and in that the composition unit comprises conveying means for feeding a first beam in a determined direction of propagation, and at least one holed mirror for reflecting said beam of substantially annular cross-section, the hole in said mirror having dimensions substantially equal to the outer dimensions of the first beam, said mirror being disposed coaxially to said direction of propagation of said first beam and being inclined to said direction of propagation by a prechosen angle, downstream of said mirror there being available a composite beam having a cross-section constituted by the concentric cross-sections of the component beams.

4,613,207

LIQUID CRYSTAL PROJECTOR AND METHOD

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Filed May 8, 1984, Ser. No. 608,135
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—331 R **104 Claims**



1. A projector, comprising liquid crystal means selectively operable for affecting light incident thereon by selectively primarily scattering or transmitting light in repsonse to a prescribed input, and optical means for selectively projecting light that is affected or not affected by said liquid crystal means, said optical means comprising discriminating means for discriminating between light scattered and light transmitted by said liquid crystal means and output meand for projecting as output light the light scattered by said liquid crystal means.

58. A projector, comprising liquid crystal means selectively operable for affecting light incident thereon, and optical means for selectively projecting light affected or not affected by said liquid crystal means, said liquid crystal means being operative to at least one of scatter or absorb light in the absence of a presecribed input and transmit light incident thereon in response to a prescribed input applied thereto, said optical means comprising input means for directing light to said liquid crystal means and output means for projecting as output light one of the light scattered or the light transmitted by said liquid crystal means, said output means comprising discriminating means for discriminating between light scattered and light transmitted by said liquid crystal means, and projecting means for projecting light received from said discriminating means, said discriminating means comprising an optical stop, and said projecting means comprising means for focusing light transmitted thorugh said liquid crystal means onto said stop for blocking thereby and for directing light scattered by said liquid crystal means for projection.

4,613,208

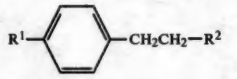
COLORING SUBSTANCE-CONTAINING LIQUID CRYSTAL MIXTURES

Arthur Boller, Binningen; Alfred Germann, Basel; Martin Petrzilka, Kaiseraugst, and Martin Schadt, Seltisberg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 18, 1983, Ser. No. 553,202
Claims priority, application Switzerland, Nov. 29, 1982, 6923/82; Sep. 30, 1983, 5303/83
Int. Cl.[4] G02F *1/13*; C09K *3/34*
U.S. Cl. 350—349 **17 Claims**

1. A liquid crystalline mixture comprising

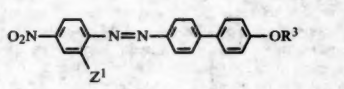
a. at least one compound of the formula:



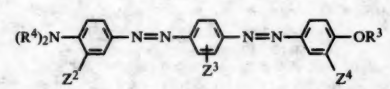
I

wherein R^1 is alkyl, alkoxy, p-alkylphenyl, p-alkoxyphenyl, trans-4-alkylcyclohexyl, 4'-alkyl-4-biphenylyl, p-(trans-4-alkylcyclohexyl)phenyl, 2-(trans-4-alkylcyclohexyl)ethyl or p-[2-(trans-4-alkylcyclohexyl)ethyl]phenyl and R^2 is trans-4-alkylcyclohexyl; or R^1 is trans-4-alkylcyclohexyl and R^2 is p-(trans-4-alkylcyclohexyl)phenyl, p-[2-(trans-4-alkylcyclohexyl)ethyl]phenyl or 4'-(trans-4-alkylcyclohexyl)-4-biphenylyl; or R^1 is p-alkylphenyl and R^2 is p-[2-(trans-4-alkylcyclohexyl)ethyl]phenyl; and the alkyl and alkoxy groups in the substituents R^1 and R^2 are straight-chain groups of 1 to 7 carbon atoms, and;

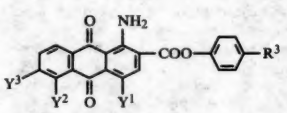
b. at least one dichroic colouring substance selected from the group of compounds consisting of:



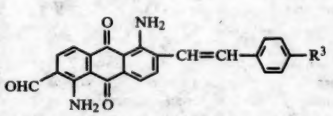
II



III

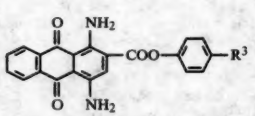


IV



IVa

and



V

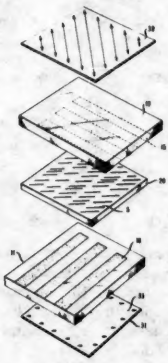
wherein R^3 is straight-chain C_1–C_{12}-alkyl and R^4 is straight-chain C_1–C_4-alkyl, Z^1 is hydrogen or chlorine, one of the symbols Z^2, Z^3 and Z^4 is chlorine and the other two are hydrogen, and Y^1 is hydrogen, Y^2 is an amino group and Y^3 is methyl or Y^1 is hydroxy and Y^2 and Y^3 are hydrogen.

4,613,209

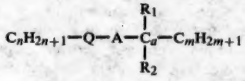
SMECTIC LIQUID CRYSTALS

John W. Goodby, Berkeley Heights, and Thomas M. Leslie, Scotch Plains, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 23, 1982, Ser. No. 361,361
Int. Cl.[4] G02F *1/13;* C09K *19/06, 19/32, 19/20, 3/34*
U.S. Cl. 350—350 S 14 Claims

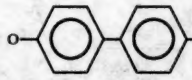


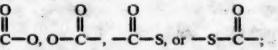
1. A display comprising (1) a liquid crystal material, (2) a plurality of electrodes suitable for applying a voltage to said liquid crystal material, (3) electronic means for applying a voltage to a desired electrode, and (4) means for producing an observable optical change upon application of an appropriate voltage, wherein said liquid crystal comprises a liquid crystal in the smectic C phase characterized in that said liquid crystal material comprises a compound represented by the formula



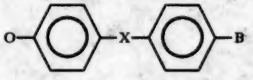
where Q is a core entity that comprises a moiety chosen from the group consisting of

(I)

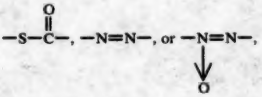


where Y is  ;

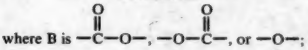
(II)



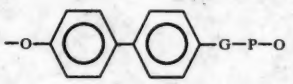
where X is ,

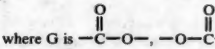


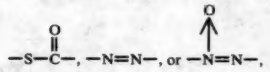
-continued

where B is  ;

(III)

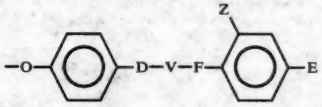


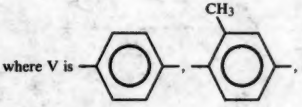
where G is  ,

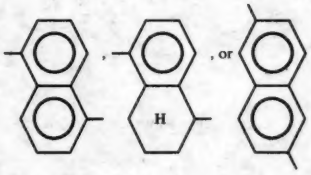


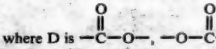
where P is ;

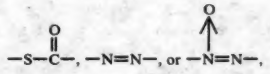
(IV)



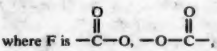
where V is  ,

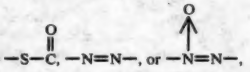


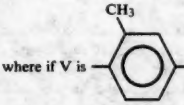
where D is  ,



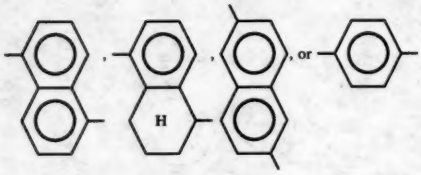
where E is ,

where F is  ,



where if V is  then Z is H and where if V is

-continued



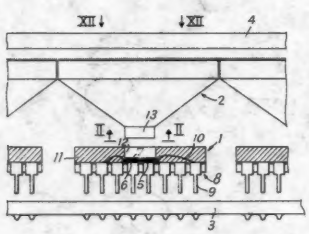
then Z is H, or CH_3, where A provides a separation between Q and C_a which is at least 2.0 Å, and where C_a is an appropriate asymmetric carbon atom whose asymmetry is produced by an appropriate choice of R_1 and R_2.

4,613,210

DEVICE RELATING TO ELECTRO-OPTICAL IMAGE DISPLAY

Jean Pollard, 27, Rue du Parc à Foulon, Villebon-sur-Yvette, France 91120

Continuation of Ser. No. 479,329, Mar. 28, 1983, abandoned. This application Feb. 14, 1986, Ser. No. 829,847
Claims priority, application France, Apr. 2, 1982, 82 05848
Int. Cl.[4] G02F *1/03, 1/133*
U.S. Cl. 350—356 **8 Claims**



1. An electro-optic thin screen image display device comprising:

at least one module consisting of a monolithic standard commercial size silicon micro-chip integrated circuit having a surface area in the order of 50 sq. mm. and having on one side a pattern array matrix of electrically, energizable integral contact surfaces which constitute quasi-contiguous object pixels;

an electro-optical transducer layer disposed in contact with said side of said chip;

a transparent window having a thickness in the order of 50 microns covering said transducer layer;

a bundle of plastic optic fibers, each of which has an object end and an image end;

first means for fixedly securing the object end of each fiber of said bundle adjacent to said transparent window and in a predetermined location with respect to a preselected object pixel on said chip;

second means for fixedly securing the image end of each fiber of said bundle in a predetermined stacked position which corresponds to the position of the object end of the same fiber in relation to other fibers of said bundle, but in expanded format; and

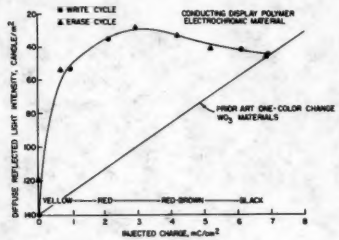
recomposer means formed of plastic composition for receiving the predisposed stacked image ends of said fibers and having a micro-pyramidal prolongation for each fiber, for enlarging the image area of each said image end of each of said fibers, to form a virtually contiguous regular array of image pixels.

4,613,211

ELECTROCHROMIC DEVICES

Yoram S. Papir, Emeryville, and Albert H. Schroeder, Richmond, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 21, 1983, Ser. No. 554,153
Int. Cl.[4] G02F *1/23*
U.S. Cl. 350—357 **21 Claims**



1. An electrochromic device comprising:

a case, said case has a transparent face and a face opposite thereto which is capable of highlighting the display colors of the device during the write cycle;

a display electrode within said case and adjacent said transparent face, said display electrode comprises a transparent conductive electrode and a display polymer film attached thereto, said display polymer film comprises a linear tractable electroactive polymer, said polymer is capable of undergoing reversible oxidation, reversible reduction or both to form a linear charged, colored polymer incorporating charge-compensating ionic dopants, said polymer comprises diradical repeat units selected from the group consisting of a heterocyclic ring system including at least one Group 5B or Group 6B atom, wherein none of the ring carbon atoms are saturated, a heterocyclic ring system including at least one Group 5B or Group 6B atom wherein none of the ring carbon atoms are saturated and a connecting unit, and mixtures thereof, wherein said diradical repeat unit in the form of a monomeric repeat unit is capable of undergoing reversible oxidation, reversible reduction or both to form a stable ionic species and wherein said connecting unit is a conjugated system or atom or group of atoms which maintain π-orbital overlap with the heterocyclic ring system;

a counter electrode adjacent to said light-colored face;

an electrolyte; and

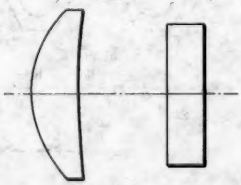
means for applying a voltage and current to said display electrode and said counter electrode.

4,613,212

OBJECTIVE LENS FOR OPTICAL DISK

Arai Norikazu, Komae, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 700,760
Claims priority, application Japan, Feb. 29, 1984, 59-36145
Int. Cl.[4] G02B *13/18, 21/02*
U.S. Cl. 350—432 **8 Claims**



1. An objective lens for an optical disk comprising a positive

meniscus lens or flat convex lens whose convex surface is directed towards the object and a surface on the object side is an aspherical surface, characterized in that the following conditions are satisfied:

$$0.38 < \frac{r_1}{nf} < 0.48$$

$$1.7 < n$$

$$0.08 < \frac{(n-1)^3}{(NA)^4}\ \frac{\Delta l}{f} < 0.15$$

where

f: focal length of whole system

n: refrective index of lens

r_1: vertex radius of curvature of surface on object side

NA: numerical aperture of lens

$\Delta 1$: difference in a direction of optical axis the extreme peripheral position of effective diameter of said aspherical surface between aspherical surface on the object side and the reference spherical surface having radius of curvature r_1 which contacts with the vertex of the aspherical surface, $\Delta 1$ is positive when radius of curvature of said aspherical surface becomes weak as it is moved away from the optical axis.

4,613,213

MONOCHROMATIC BEAM CONCENTRATOR

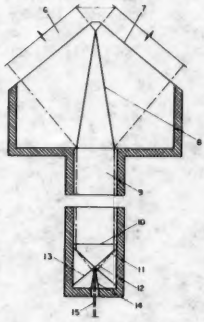
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Oct. 5, 1984, Ser. No. 658,258

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] G02B *3/04*; F24J *2/08*

U.S. Cl. 350—432 **1 Claim**



1. A monochromatic beam concentrator 3RT:CM comprising an upper stage lens RT (1) of monochromatic glass having a convex conical section (7) which receives and transmits a convergent conical incipient beam (6) of diffused sunlight, and having a concave conical section (8) which refracts and emits incipient beam (6), forming concentrated whole beam (9) which is emitted parallel to the vertical optic axis; and comprising a lower stage lens 2RT (2) mounted below upper stage lens RT (1) and comprising an upper component lens RT (4) having a planar section (10) which receives and transmits concentrated whole beam (9), and having a convex conical section (11) which refracts concentrated whole beam (9), forming convergent conical beam (12); and comprising a lower component lens RT (5) having a convex conical section (13) which transmits convergent conical beam (12), and having a concave conical section (14) which refracts and emits convergent conical beam (12), forming concentrated whole beam (15) which is emitted parallel to the vertical optic axis.

4,613,214

OPTICAL DEVICE FOR VIEWING THE ADJUSTMENT OF OPTICAL WAVEGUIDES

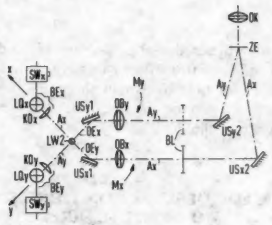
Rudolf Brugger, Puchheim; Gerhard Jonke, Gilching, and Peter Steinmann, Deisenhofen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,927

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335579

Int. Cl.[4] G02B *6/24, 21/18, 21/06*

U.S. Cl. 350—511 **12 Claims**



1. An optical device for observing the ends of optical waveguides along two directions which extend perpendicular to each other and to the axis of the waveguides as the ends are being adjusted relative to each other for splicing purposes, said device comprising two microscopes, each with an optical path, said microscopes being arranged with the optical path extending perpendicularly to each other and intersecting in an object plane, first means acting on the optical path of at least one microscope at a point spaced from the intersection point to bring the two paths of the two microscopes to a common intermediate image plane, a common eyepiece for observing the common intermediate image plane and second means for enabling alternate and separate observing of each of the two directions through the common eyepiece so that the adjustments along each of the two directions can be separately observed.

4,613,215

MOUNTING BRACKET FOR REAR VIEW MIRROR WITH SPRING DETENT

Ian F. Ayton, Palos Verdes Estates, Calif., assignor to Orion Industries, Inc., Compton, Calif.

Filed Oct. 9, 1984, Ser. No. 658,524

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—604 **4 Claims**

1. A mounting bracket for a vehicle rear view mirror, said mounting bracket comprising:

a pivot plate securable at its inner portion to a vehicle and formed with a vertically extending detent hole at its outer portion;

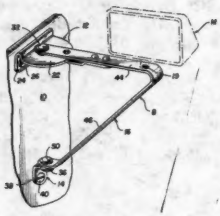
a pivot anchor securable to the vehicle below said pivot plate in vertical alignment therewith;

a mirror support arm having a horizontal element that is attached to a mirror at its outer portion and a downwardly and inwardly extending element connected to the outer end of said horizontal element, with the lower end of said downwardly and inwardly extending element being pivotally connected to said bracket;

pivot means connecting the inner end of the horizontal

element of said mirror support arm to the intermediate portion of said pivot plate;

an elongated spring finger in vertical alignment with said mirror support arm, connected at its outer portion to said arm, with the free end of said finger being biased vertically upwardly toward said pivot plate; and



vertically aligned detent projections on said mirror support arm and said spring finger that are vertically aligned with said detent hole to extend thereinto so as to releasably retain said mirror support arm in a position extending away from the vehicle.

4,613,216

DEVICE FOR OBSERVATION THROUGH A WALL IN TWO OPPOSITE DIRECTIONS

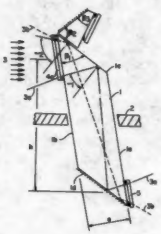
Jean-Pierre Herbec, Villepreux; Michel Laisney, Cressely; Jacques Murat, Tulle, and Patrick Serpeau, Creteil, all of France, assignors to L'Etat Francais, Paris, France

Filed Mar. 20, 1985, Ser. No. 713,887

Claims priority, application France, Mar. 27, 1984, 84 04707

Int. Cl.[4] G02B *23/02, 23/08, 5/08*

U.S. Cl. 350—618 **17 Claims**



1. An optical device for observation through a wall, comprising:

a main parallelogram-shaped optical unit having two pairs of parallel faces, a first objective lens disposed adjacent an upper end of said main unit, and a first eyepiece lens disposed adjacent an opposite end thereof and diagonally opposite said objective lens, the faces of the main optical unit being so angled relative to one another that a light beam entering through the first objective lens will be reflected by two of said faces to exit through said first eyepiece lens;

an upper optical unit disposed above the upper end of said main optical unit and having a second objective lens and at least one reflective face for reflecting a light beam entering through said second objective lens into said main optical unit, said light beam entering through said second objective lens being reflected a total of an odd number of times by said at least one reflective face of said upper optical unit and at least one face of said main optical unit so as to exit through an eyepiece selected from the group consisting of said first eyepiece and a second eyepiece disposed adjacent to said first eyepiece.

7. An optical device for observation through a wall, comprising:

a main parallelogram-shaped optical unit having two pairs of parallel faces, a first objective lens disposed adjacent an upper end of said main unit, and a first eyepiece lens disposed adjacent a lower end thereof and diagonally opposite said objective lens, the faces of the main optical unit being so angled relative to one another that a light beam entering through the first objective lens will be reflected by two of said faces to exit through said first eyepiece lens;

an upper optical unit disposed above said main optical unit and having a second objective lens and at least one reflecting face for reflecting light entering through said second objective lens through said main optical unit;

a lower optical unit disposed below said main optical unit and having a second eyepiece lens and at least one reflecting face for reflecting said light beam reflected by said upper optical unit through said main optical unit, said light beam entering through said second objective lens being reflected a total of an odd number of times by said at least one face of said upper optical unit and said at least one face of said lower optical unit so that said light beam will exit through said second eyepiece lens.

4,613,217

SPECTACLE LENS HAVING ASTIGMATIC POWER

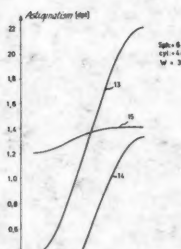
Gerhard Fuerter, Ellwangen, and Hans Lahres, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 258,996, Apr. 30, 1981, abandoned. This application Jan. 25, 1984, Ser. No. 573,580

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016936

Int. Cl.[4] G02C *7/02*

U.S. Cl. 351—176 **13 Claims**



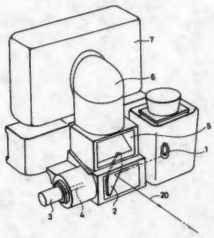
1. A spectacle lens of astigmatic power which has at least one lens surface of other than spherical or toric form, characterized by the fact that (a) for every region of viewing-axis incidence with said lens surface the principal curvatures and the principal curvature-directions are such that the astigmatism of the spectacle lens and of the eye to be corrected are individually corrected and adapted to each other as to direction and extent, and (b) that said lens surface is twice continuously differentiable at each point.

4,613,218

ILLUMINATING LIGHT BEAM AXIS ADJUSTING MECHANISM IN OPHTHALMOSCOPE WITH PHOTOGRAPHING DEVICE

Takeshi Machida, and Takashi Komori, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,796
Claims priority, application Japan, Sep. 28, 1982, 57-146725[U]
Int. Cl.[4] A61B 3/14, 3/10
U.S. Cl. 351—206 4 Claims



1. In an ophthalmoscope having a light source, a photographing device, and a mirror for reflecting and illuminating light beam originating from the light source, said mirror being rotatable between at least a normal, visual viewing position and a distinct photographing position, an apparatus for adjusting a direction of travel of the illuminating light beam, comprising;

a mirror frame for holding said mirror;

an outer frame;

means for rotating said mirror, said rotating means comprising a knob, a rotary shaft integrally coupled to said knob and axially slidably fitted in said outer frame and said mirror frame, and means for transmitting rotation of said rotary shaft to said mirror frame to rotate said mirror; and

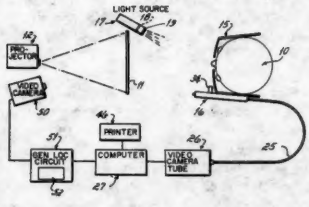
stop means associated with said mirror rotating means for stopping rotation of said mirror at a predetermined position suitable for conducting a photographic operation, said stop means comprising an interlocking member fixedly attached to said rotary shaft, said interlocking member having a hole therein, a click ball disposed in said hole, and means for biasing said click ball radially outwardly against an inner surface of said outer frame.

4,613,219

EYE MOVEMENT RECORDING APPARATUS

John D. Vogel, Sagamore Hills, Ohio, assignor to Burke Marketing Services, Inc., Cincinnati, Ohio

Filed Mar. 5, 1984, Ser. No. 586,083
Int. Cl.[4] A61B 3/14
U.S. Cl. 351—209 4 Claims



1. Apparatus for recording eye movement,

a light source positionable in front of a subject so that light rays can impinge on the cornea of the subject and reflect a secondary glint,

a receiver for said light rays mountable on the head of the subject, said receiver receiving a secondary glint from a cornea of the subject on which said receiver is mounted,

a glass dome mounted in said receiver to receive light rays directly from said source, unaffected by reflection from the cornea, and reflect a primary glint from said source off said dome,

means for transmitting said primary and secondary glints to a video camera tube,

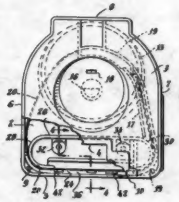
and means for comparing the positions of said primary and secondary glints to determine eye movement with compensation for head movement.

4,613,220

ENDLESS FILM CARTRIDGE AND PRESSURE SUPPORT PLATE THEREFOR

Leon M. Levy, Chicago, Ill., assignor to C. A. Parshall, Inc., Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 658,566
Int. Cl.[4] G03B 23/02
U.S. Cl. 352—78 R 11 Claims



1. A pressure support plate for film in a film cartridge adapted to hold an endless strip of film for storage and for display in a projector, said cartridge including a housing with upper and lower surfaces, a front and sides, a projection aperture in said front, a film storage chamber, and guide members for directing said film serially from said chamber to said projection chamber and back, said support plate including

an ellipsoidal loop having elongated front and rear sections,

said front section being generally planar and having a projection opening in the center thereof and projector alignment openings in at least one edge thereof,

said front and rear sections being spaced sufficiently to receive a projection mirror between them and in line with said front projection opening,

means formed integrally with said rear section for securing said loop to one of said surfaces,

said loop being made of resilient material and dimensioned relative to its mounting position on said surface, to resiliently press toward the perimeter of said front projection aperture,

whereby film may be driven in said cartridge and will be held in a projection plane at said projection aperture.

4,613,221

DEVELOPING APPARATUS

Haruo Takase; Yoshimitsu Hanai, both of Kanagawa, and Ryuzi Otomo, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1985, Ser. No. 711,429
Claims priority, application Japan, Mar. 13, 1984, 59-47973; Mar. 13, 1984, 59-47974; Mar. 13, 1984, 59-47976
Int. Cl.[4] G03D 3/13
U.S. Cl. 354—321 33 Claims

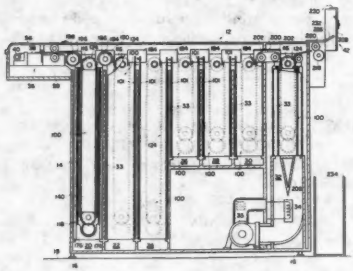
1. A developing apparatus which conducts a developing

operation by conveying a film through a treating tank containing a developing solution, comprising:

(a) an endless timing belt at least one portion of which is immersed in said treating tank;

(b) sprocket wheels engaged with said timing belt such as to guide and drive the same;

(c) engagement projections formed on the outer periphery of said timing belt at a predetermined spacing from each other;



(d) a leader to which one of the ends of a film to be developed is attached and which has engagement bores engageable with said engagement projections, and is pulled by said timing belt so that said film is conveyed through said treating tank; and

(e) guide means disposed such as to oppose the outer periphery of said timing belt and adapted to retain said leader between the same and said timing belt when said leader is driven through said engagement projections, thereby preventing disengagement of said engagement projections from said engagement bores in said leader.

4,613,222

FILM ACCUMULATING DEVICE FOR DEVELOPING APPARATUS

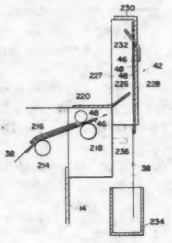
Haruo Takase; Yoshimitsu Hanai, both of Odawara, and Ryuzi Otomo, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 15, 1985, Ser. No. 712,050

Claims priority, application Japan, Mar. 15, 1984, 59-050261

Int. Cl.[4] G03D *3/13*

U.S. Cl. 354—321 **21 Claims**



1. A film accumulating device which is disposed at the rear of a film developing apparatus such as to accumulate developed films, comprising:

(a) driving means which pulls out from a developing line a leader attached to the leading end of a film;

(b) guide means which upwardly guides said leader being fed out by said driving means;

(c) a stopper which stops a portion of said leader near its leading end at a predetermined position, said leader being upwardly guided by said guide means; and

(d) a hook disposed in the vicinity of said stopper such as to suspend said leader by engaging a bore formed in said leader, whereby the developed film is deposited while being suspended from said hook through said leader which is in engagement with said hook.

4,613,223

METHOD OF AND APPARATUS FOR TREATING WITH A LIQUID A SHEET OF FLEXIBLE PHOTOGRAPHIC MATERIAL HAVING A PHOTOGRAPHIC EMULSION ON ONE FACE THEREOF

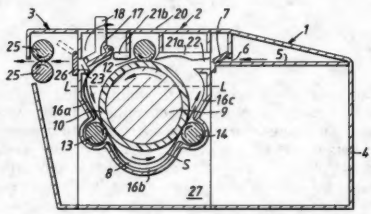
Peter J. Cherry, Lancaster, and Barrie A. Freeman, Wilmslow, both of England, assignors to Ciba-Giegy AG, Basel, Switzerland

Filed Mar. 18, 1985, Ser. No. 713,130

Claims priority, application United Kingdom, Mar. 29, 1984, 8408055

Int. Cl.[4] G03D *3/08*

U.S. Cl. 354—322 **9 Claims**



1. A method of treating with a liquid a sheet of flexible photographic material having a photographic emulsion on one face thereof, which comprises introducing the sheet of photographic material into a processing vessel from above the liquid in the vessel and into the liquid with the other face of the photographic material directed to the inner wall of the vessel and the emulsion surface directed to the interior of the vessel, driving the sheet along a curved endless path within the vessel by passing the sheet through the nips between at least one pair of driven rollers, guiding the sheet substantially to follow the inside wall of the vessel during its passage through the liquid so that the emulsion surface does not come into contact with a stationary part of the vessel, the driving and guiding being carried out for sufficient time for the treatment to be completed and removing the sheet from the vessel so that the emulsion surface does not come into contact with a stationary part of the vessel.

4,613,224

MOTOR DRIVER FOR AUTO-FOCUS CAMERA

Akira Ogasawara, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 510,681, Jul. 5, 1983, abandoned. This application Jan. 18, 1985, Ser. No. 692,631

Claims priority, application Japan, Jul. 10, 1982, 57-120153; Sep. 14, 1982, 57-158792

Int. Cl.[4] G03B *3/00*

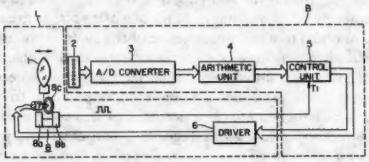
U.S. Cl. 354—402 **17 Claims**

1. A lens barrel containing an image-forming optical system having determined optical characteristics and movable in order to form an image of light from an object on a determined plane, said lens barrel being removably attachable to a camera body provided with a least an output terminal for a position pulse-form signal having a determined period and a determined duty ratio and indicative of the positional relation between the image forming position of said object light through said image-forming optical system and said determined plane and said lens

barrel being provided with at least an input terminal connectable with said output terminal when said lens barrel is mounted on said camera body, and being capable of driving said image-forming optical system in the direcetion for forming the image of said object light on said determined plane by means of said position signal, said lens barrel comprising:

(a) driving means including a motor for driving said image-forming optical system;

(b) means for supplying a driving current to said motor



(c) means for generating characteristic signal indicative of said determined optical characteristics of said image-forming optical system;

(d) means for converting said position signal into an output signal whose period is equal to said determined period and whose duty ratio is different from said determined duty ratio in response to said characteristic signal and producing said converted signal; and

(e) means for controlling said driving current flowing into said motor according to said output signal from said conversion means.

4,613,225

AUTOMATIC FOCUSING DEVICE

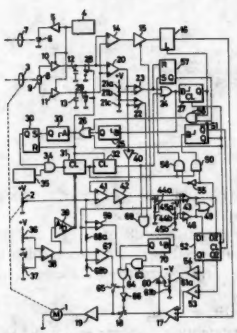
Takashi Kawabata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,288

Claims priority, application Japan, May 17, 1984, 59-98957; May 17, 1984, 59-98958; May 17, 1984, 59-98959

Int. Cl.⁴ G03B *3/10*

U.S. Cl. 354—403 **6 Claims**



1. A focusing device comprising:

(a) a focus detecting circuit including a light receiving portion;

(b) a drive circuit for driving movement of a lens based on the output of said focus detecting circuit;

(c) a control circuit having a first mode in which a focus detecting operation by said focus detecting circuit and a lens drive operation by said drive circuit are alternatively performed, and a second mode in which the lens drive operation is carried out during the focus detecting operation; and

(d) a selecting circuit for selecting the modes of said control circuit in response to a processing signal based on the output of the light receiving portion by said focus detecting circuit.

4,613,226

DEVELOPING HEAD FOR ELECTROPHOTOGRAPHIC APPARATUS

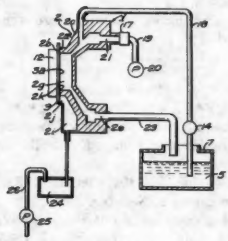
Akinori Kimura, and Shuichi Ohtsuka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1983, Ser. No. 564,493

Claims priority, application Japan, Dec. 23, 1982, 57-225047; Mar. 4, 1983, 58-34458; Mar. 11, 1983, 58-39073

Int. Cl.⁴ G03G *15/10*; G03D *7/00, 5/00*

U.S. Cl. 355—10 **13 Claims**



1. In a developing head for an electrophotographic apparatus which comprises a developing mask means having a developing chamber defined by a framed opening facing the photosensitive surface of an electrophotographic material for electrophotography, a mouth of said opening abutting said photosensitive surface and an outer peripheral surface of said developing mask means opposing the photosensitive surface and wherein the photosensitive surface is contacted with a liquid developer supplied from a liquid feeding means via said developing chamber to achieve development of the electrophotographic material, the improvement wherein:

a gas applying means is provided to apply gas onto the photosensitive surface via the developing chamber to thereby squeeze off the liquid developer after it is contacted with the photosensitive surface;

a pressing plate is provided to press the electrophotographic material against said mouth of the framed opening during the developing process of applying the liquid developer and during the squeezing process of applying the gas to remove the liquid developer, said pressing slate being released when the electrophotographic material is advanced to the next frame of electrophotosensitive material; and

a pressure reduction means is provided to apply a negative pressure to a space between the photosensitive surface and at least a portion of the mouth of the framed opening of the developing mask means.

4,613,227

IMAGE FORMING APPARATUS

Takeshi Honjo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,293

Claims priority, application Japan, Feb. 8, 1982, 57-18412; Feb. 8, 1982, 57-18413

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 C **12 Claims**

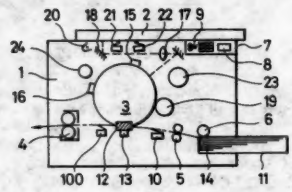
1. An image forming apparatus comprising;

means for transporting a sheet;

processing means for forming an image on the sheet;

size signal producing means for producing a signal corresponding to the size of the sheet; and

means for controlling said processing means so as to prevent the start of a next image forming cycle until the sheet is



transported beyond a predetermined processing member of said processing means when said size signal indicates a predetermined size.

4,613,228

SURFACE POTENTIOMETER

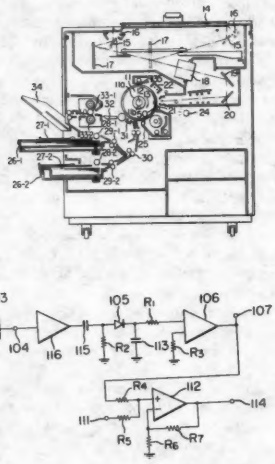
Koji Suzuki, Yokohama, and Yoshihiro Kawatsura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 438,302, Oct. 29, 1982, abandoned, which is a continuation of Ser. No. 231,170, Feb. 3, 1981, abandoned, which is a continuation of Ser. No. 969,886, Dec. 15, 1978, abandoned. This application Jul. 17, 1984, Ser. No. 631,643

Claims priority, application Japan, Dec. 21, 1977, 53-7840

Int. Cl.[4] G03G *15/02, 15/06*

U.S. Cl. 355—14 R **21 Claims**



18. Electrostatic recording apparatus comprising:

a photosensitive body;

means for forming an electrostatic latent image on said photosensitive body, said means including charging means for charging said photosensitive body with one electric polarity, exposure means for exposing said photosensitive body, and discharging means for discharging said photosensitive body with alternating current or an electric polarity opposite to said one electric polarity concurrently with exposure by said exposure means;

developer means for developing the latent image;

a measurement electrode provided adjacent to said photosensitive body for measuring a surface potential of said latent image, wherein said electrode is capable of measuring a surface potential which is varied between positive and negative values;

chopper means for intermittently chopping an electric field between said measurement electrode and said photosensitive body;

driving means for driving said chopper means to induce an AC signal in said measurement electrode;

bias applying means for applying to said chopper means as a predetermined bias voltage, either one of a voltage greater than or equal to a maximum value of the surface potential of said photosensitive body, or a voltage smaller than or equal to a minimum value of the surface potential, wherein said electrode produces a voltage corresponding to the difference between a surface potential of said surface to be measured and said bias voltage, and said electrode provides unlike voltage outputs for surface potentials having like absolute values but unlike polarities;

rectifier means for rectifying the voltage induced in said measurement electrode; and

operational means coupled to said rectifier means for subtracting from the rectified voltage of said rectifier means a voltage corresponding to said bias voltage.

4,613,229

CLEANING APPARATUS

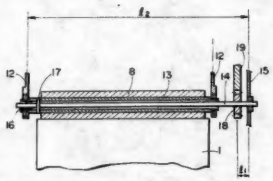
Hiroyuki Miyake, and Takaji Yonemori, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1985, Ser. No. 776,223

Claims priority, application Japan, Oct. 2, 1984, 59-206604

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—15 **15 Claims**



1. Apparatus for cleaning the surface of an image carrying member, said apparatus comprising,

a cleaning roller having a resilient layer,

mounting means for holding said cleaning roller and causing it to press resiliently against the surface of an image carrying member,

a cleaning roller drive shaft,

a fixed bearing rotatably supporting said drive shaft at a first location therealong,

a rotatable drive element rotatably driving said drive shaft at a second location therealong and producing a lateral force on said drive shaft, and

a connecting arrangement between said drive shaft and said cleaning roller for transmitting rotation of said drive shaft to said cleaning roller and for transmitting the lateral force of said drive shaft from a third location therealong to said cleaning roller,

the distance along said drive shaft between said first and third locations being substantially greater than the distance along said drive shaft between said first and second locations.

4,613,230
WAFER EXPOSURE APPARATUS

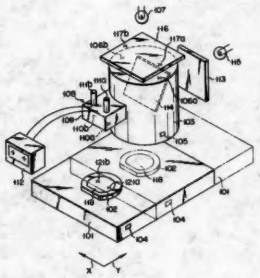
Hiroshi Iwai, Takaidonishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 30, 1982, Ser. No. 373,629

Claims priority, application Japan, May 6, 1981, 56-67911; Sep. 22, 1981, 56-149865

Int. Cl.⁴ G03B *27/42, 27/52, 27/70*

U.S. Cl. 355—53 **3 Claims**



1. A wafer exposure apparatus, comprising:

a chip formation mask having a desired chip pattern;

a mark formation mask, different from said chip formation mask, having a mark pattern;

an optical column for projecting said chip pattern on a reduced scale onto a wafer, said mark formation mask being provided on the side of said optical column and said optical column including inner means for projecting said mark pattern of said mark formation mask onto the wafer; and

means for carrying out a step and repeat exposure process on the wafer.

4,613,231
LASER RANGE FINDER WITH NON-LINEARITY COMPENSATION

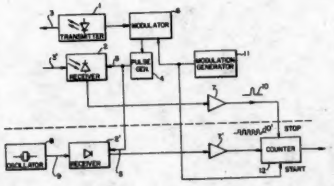
Guenter Wichmann, Leimen, Fed. Rep. of Germany, assignor to Eltro GmbH, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,316

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310055

Int. Cl.⁴ G01C *3/08*

U.S. Cl. 356—5 **5 Claims**



1. A laser range finder, comprising:

(a) transmitter means for providing transmitter pulses;

(b) light emitting means for emitting light pulses in response to said transmitter;

(c) modulation generation means for generating a phase modulation control signal;

(d) phase modulation means responsive to said transmitter means and said modulation generation means to produce pulses delayed in time with respect to said transmitter pulses by a delay proportional to said phase modulation control signal;

(e) first receiver means for receiving reflections of said transmitted light pulses reflected by an object whose range is to be measured;

(f) sampling means responsive to said first receiver means for generating a first low-frequency representation of the reflected pulses;

(g) trigger means responsive to said sampling means to produce a trigger signal in response to the first low-frequency representation produced by said sampling means;

(h) high-frequency oscillator means for generating high-frequency oscillations with a frequency which corresponds to the desired accuracy of measurement;

(i) means for transposing said high-frequency oscillations, utilizing a sampling pulse, into a second low-frequency representation; and

(j) counter means for counting the low-frequency zero-crossings of the second low-frequency representation produced by said means for transposing said high-frequency oscillations, said counts beginning with the onset of the low-frequency cycle produced by said modulation generation means.

4,613,232
MEASURING DEVICE FOR TESTING OPTICAL SYSTEMS OF AN ENDOSCOPE

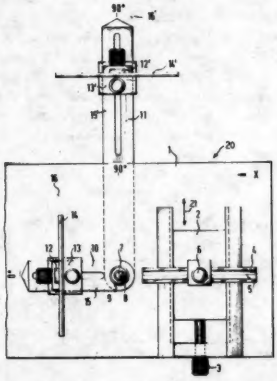
Jörg Diener, Oberderdingen, and Jürgen Zobel, Bretten-Sprantal, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,929

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330134

Int. Cl.⁴ G01B *9/00*

U.S. Cl. 356—124 **4 Claims**



1. A device for measuring and checking geometric-optical data of an optical system of an endoscope, said device including a base plate having a planar surface, a carriage mounted on said surface of the plate for movement along a straight line and having means for holding the carriage in a fixed position on said line, a rail having a longitudinally extending V groove for receiving a portion of the optical system of an endoscope and having means for fixing the portion therein, said rail being mounted on said carriage with the V-groove being parallel to said planar surface and extending perpendicular to said line, a shaft terminating at one end in a centering cone being mounted on the base to extend perpendicular to the planar surface with a tip of the cone lying on a lower edge of a viewing window of an endoscope being received in said groove, at least one extension arm being pivotally mounted on the shaft to move in a

plane extending parallel to the planar surface, said shaft having means for locking each arm in the desired angular position, measuring disks for each arm and each arm having mounting means for positioning the disk to extend in a plane perpendicular to the longitudinal axis of the arm and perpendicular to the planar surface, said mounting means including means to adjust the distance of the disk from the shaft and means to adjust the vertical height of the disk from the planar surface.

4,613,233

SINE BAR MECHANISM AND MONOCHROMATOR AND SPECTROPHOTOMETER INCLUDING SUCH A SINE BAR MECHANISM

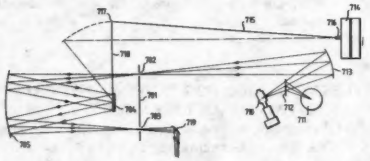
James B. Wilson, Royston, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1984, Ser. No. 585,066

Claims priority, application United Kingdom, Mar. 2, 1983, 8305744

Int. Cl.[4] G01J *3/18, 3/06*

U.S. Cl. 356—328 **13 Claims**



1. A sine bar mechanism for rotating a diffraction grating in a monochromator, said sine bar mechanism comprising:

an arm carrying a diffraction grating, said arm being rotatable about a first pivot,

an elongated member pivotally connected to said arm at one end of said member, said member being pivotally mounted at least adjacent to the other end of said member with the pivotal mounting being fixed in position relative to said first pivot of said arm, and

first means for varying the distance between the pivotal connection at said one end of said member and said pivotal mounting adjacent said other end of said member in order to cause rotation of said arm about said first pivot.

4,613,234

PROFILE IMAGING TECHNIQUES

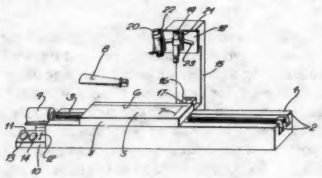
John S. Cruickshank, Inchture, Scotland, assignor to LBP Partnership, St. Louis, Mo.

Filed Jan. 5, 1984, Ser. No. 568,381

Claims priority, application United Kingdom, Jan. 10, 1983, 8300512

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—394 **18 Claims**



1. A method of measurement and/or dimensional comparison comprising the steps of:

(1) locating an object on a prescribed first plane with reference to a datum position,

(2) illuminating the object with a thin fan-shaped beam of light in a second plane substantially perpendicular to said prescribed first plane along a sufficiently narrow strip to produce a thin light trace;

(3) scanning the object in a third plane angularly displaced from said second plane by means of a video camera adjusted, focussed and positioned so as to discriminate the illuminated strip from the background and the remainder of the object;

(4) comparing the amplitude of the video signal at a series of positions along the scan with a corresponding series of values representing the desired amplitudes at those positions along the scan in order to derive error indications;

(5) linearly displacing the object a prescribed distance in said first plane in a direction which includes a component normal to the line produced by the intersection of said second and third planes and repeating steps (2) to (4);

(6) repeating step 5 until the entire volume of interest has been scanned at a plurality of intervals

wherein parts of the beam of light which are not naturally incident upon the object are reflected onto one or both sides thereof so as to illuminate re-entrant areas along said narrow strip.

3. Apparatus comprising a profiling table by means of which an object being checked is advanced along a prescribed horizontal axis in precise predetermined steps, a light beam generating means for casting a substantially vertical fan-shaped, very thin beam across the object, said beam being substantially normal to the said axis, a camera arranged to scan the strip of the object illuminated by said beam and generate a video signal representing said scan, said camera being angularly displaced from the beam with respect to the illuminated strip, a visual display unit (VDU) for displaying by means of a first trace the video signal generated by the camera and fed to a first input of the VDU, a video recorder for recording the video signal generated by the camera having an output, and a selector switch for switching the output of the camera to either the first input of the VDU or the video recorder, said VDU having a second input connected to the output of said video recorder and providing a second trace corresponding to the recorder output.

4,613,235

METHOD AND APPARATUS FOR MEASURING GLOSS WHICH CORRELATES WELL WITH VISUALLY ESTIMATED GLOSS

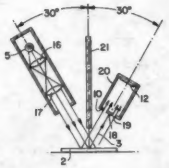
Shigeru Suga, 20-2, Yoyogi 5-chome, Shibuya-ku, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,193

Claims priority, application Japan, Feb. 29, 1984, 59-38290

Int. Cl.[4] G01N *21/47*

U.S. Cl. 356—446 **4 Claims**



1. In a method of measuring the gloss of a surface of a material by receiving light reflected from the surface and measuring the amount of light, the improvement comprising directing parallel light rays from a light source against the surface the gloss of which is to be determined at an angle of incidence, receiving a cross-section of light rays reflected from the surface at an angle of reflection equal to the angle of incidence, blocking out the central region of the cross-section of the light rays received, and measuring only the light received after the blocking out of the central region and using the measured amount as a determination of the gloss of the surface.

4,613,236

DOUBLE PENDULUM CLOCK

Norihiko Nakamura, Tokyo, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,525

Claims priority, application Japan, Aug. 11, 1983, 58-147258; Aug. 17, 1983, 58-126962[U]; Aug. 17, 1983, 58-150057; Aug. 17, 1983, 58-150058

Int. Cl.[4] G04B *17/02*

U.S. Cl. 368—165 2 Claims

1. A double pendulum clock comprising:

a first pendulum rod swingingly pivoted on a clock body and connected to a first pendulum;

a drive magnet coupled to said first pendulum rod;

a drive coil provided on the clock body to drive the first pendulum by means of electromagnetic coupling with said drive magnet;

a second pendulum rod swingingly pivoted on the clock body and connected to a second pendulum;

a supporting mechanism for said pendulum rods consisting of channel shaped supporting portions shaped like channel iron sections having V-grooves on their side wing walls, which are arranged on the either one of the top ends of said two pendulum rods or the clock body, and a knife-edge base plate in order to swingingly support said two supporting portions along the common supporting axis, which is fixed on the other one, wherein said supporting portions are placed on said knife-edge base plate so that said two channel shape supporting portions can be geared with each other at a different phase along the supporting axis direction, whereby two pendulum rods can be supported by the clock body closely and stabily to each other; and

linking magnets provided on said first and second pendulum rods at positions facing said first pendulum rod and said second pendulum rod, respectively and for swinging said second pendulum rod in accordance with the swing of said first pendulum rod by means of mutual magnetic force between linking magnets.

4,613,237

METHOD FOR DETERMINING THE TEMPERATURE OF A FLUID

Lynn A. Melton, Richardson, Tex., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 22, 1985, Ser. No. 768,307

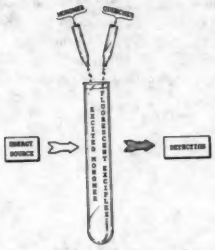
Int. Cl.[4] G01K *11/00;* G01N *21/64*

U.S. Cl. 374—162 1 Claim

1. A method for determining at least one temperature of a fluid comprising:

(a) adding a fluorescent monomer and an organic quencher to a fluid;

(b) exciting the monomer by directing an energy source of a proper wavelength at the fluid, the excited monomer than comines with the quencher to produce a fluorescent exciplex in the fluid; and



(c) determining the temperature of the fluid by detecting the relative fluorescence from the excited monomer and exciplex in the fluid.

4,613,238

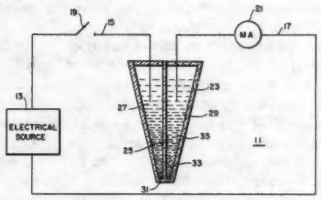
METHOD AND APPARATUS FOR MEASURING TEMPERATURE OF ULTRA SMALL AREAS

Frederick Sachs, Buffalo, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Sep. 27, 1985, Ser. No. 781,245

Int. Cl.[4] G01K *7/00, 13/00*

U.S. Cl. 374—174 20 Claims



1. A temperature measuring system for an ultra small area in which temperature is determined by electrical resistance, or by a change in electrical resistance, of an electrical circuit comprising:

(a) A temperature sensory element comprised of a thin-walled microcapillary tube having a sensing contact tip, said microcapillary tube having a septum and containing an ionic liquid having determinable electric resistance, said microcapillary tube having an outside diameter less than about 2.0 microns at the sensing tip.

(b) an electrical source,

(c) means to electrically connect said ionic liquid in said temperature sensory element to said electrical source to form an electrical circuit, and

(d) means to electrically connect said ionic liquid to an indicator to determine a change in the electrical resistance of said circuit caused by a change in the temperature of said ionic liquid as the sensing tip contacts the areas measured.

4,613,239
SOLID WINDOW CAGE FOR CYLINDRICAL ROLLER BEARING

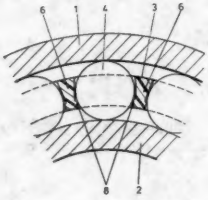
Heinrich Hofmann, and Günther Heurich, both of Schweinfurt, Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,110

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327623

Int. Cl.⁴ F16C *33/46*

U.S. Cl. 384—580 **7 Claims**



1. A window cage for a roller bearing, the cage comprising:

a pair of axially spaced apart end rings and a plurality of axially extending webs at circumferentially spaced apart locations around the end rings and joining the end rings for defining the cage; two adjacent ones of the circumferentially spaced apart webs together with the end rings define a pocket each for receiving a respective bearing roller; the webs adjacent a pocket each having a respective surface facing into and defining that pocket;

on at least one of the web surfaces defining a pocket, a holding ledge for the roller for that pocket being provided; the holding ledge having an axially generally central section which projects circumferentially of the cage further into the pocket for defining means for preventing the roller from moving radially out of the pocket past the ledge; the ledge gradually decreasing in height, measured circumferentially of the cage, at the axial sides of the central section toward both of the end rings; the ledge at both axial sides of the generally central section thereof gradually decreasing in height from the central section to respective locations substantially at the end rings, wherein the webs meet the end rings at respective transitions; and at the transitions of each of the webs with the end rings and opening into the pockets, each of the end rings having a respective undercut extending axially into the end ring and extending radially over the entire thickness of the cage.

4,613,240
APPARATUS FOR ADJUSTING AND RETAINING BEARINGS ON AN AXLE

George A. Hagelthorn, 414 South York, Dearborn, Mich. 48124

Division of Ser. No. 502,588, Jun. 9, 1982, Pat. No. 4,530,144. This application Jan. 4, 1985, Ser. No. 674,964

Int. Cl.⁴ F16C *23/06, 43/04*

U.S. Cl. 384—585 **7 Claims**

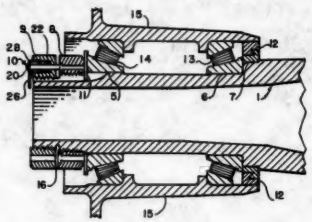
1. In a system comprising an axle assembly having bearings which are mounted, retained by a retaining means and maintained in a position on an axle spindle:

means for establishing a predetermined bearing space corresponding to proper dimensional spacing of said retaining means required to assure optimum bearing performance, and other means preventing independent movement of said retaining means once the assembled condition is achieved,

said means for establishing said predetermined space comprising inner and outer members and a spacing member projecting between said inner and outer members for a distance corresponding to the desired space,

said spacing member being carried by one of said inner or outer members and being adjustable therebetween,

said inner and outer members being inner and outer threaded



nuts, said inner nut having a plurality of holes circumferentially spaced thereon, a hole in said outer nut, a spacing member mounted on said outer member, spring means biasing said spacing member and a locking member for said hole on said outer nut and one of said holes in said inner nut.

4,613,241
PRINTING MECHANISM FOR DOT MATRIX PRINTERS

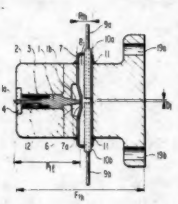
Kunio Kitagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 2, 1985, Ser. No. 688,131

Claims priority, application Japan, Jan. 5, 1984, 59-429; Jun. 11, 1984, 59-120190

Int. Cl.⁴ B41J *3/12, 23/24*

U.S. Cl. 400—121 **24 Claims**



1. A printing mechanism comprising:

a printing element having an impacting surface at its front end and a driven surface at its rear end;

a holder for slidably supporting said printing element, said holder having a hollow portion located to the rear of said printing element, said hollow portion having rigid inner walls except at a front portion which faces said rear end of said printing element;

a hermetically sealed container having an elastic wall portion;

a pressure transmitting medium contained in said hermetically sealed container; and

driving means provided inside said hermetically sealed container for expanding said pressure transmitting medium;

said hermetically sealed container with said pressure transmitting medium and said driving means situated therein being located within said hollow portion of said holder such that said elastic wall portion is positioned at said front portion of said hollow portion to contact said rear end of said printing element;

whereby the expansion of said pressure transmitting medium by said driving means is concentrated at said elastic wall portion, to move said elastic wall portion to drive said printing element.

11. A printing mechanism comprising:

a printing element having an impacting surface at its front end and a driven portion at its rear end;
a holder for slidably supporting said printing element;
a hermetically sealed container including a bellows capable of expansion and contraction in accordance with a volumetric change in the content of said container, the front end of said bellows contacting said rear end of said printing element;
a pressure transmitting medium contained in said hermetically sealed container and comprising the content of said container; and
driving means provided at least partially inside said hermetically sealed container for expanding said pressure transmitting medium.

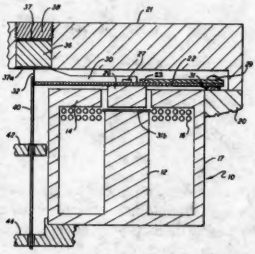
18. a printing mechanism comprising:
a printing element having an impacting surface at its front end;
a movable electrode having a thick portion integral with a rear end of said printing element and a thin portion projected to the rear of said thick portion;
a holder for slidably supporting said thick portion of said movable electrode;
a hermetically sealed housing coupled with said holder, said movable electrode constituting a portion of an inner wall of said hermetically sealed housing, said thin portion of said movable electrode being located within said hermetically sealed housing;
a fixed electrode fixedly disposed within said hermetically sealed housing so as to face said thin portion of said movable electrode;
drive means for supplying a voltage between said movable electrode and said fixed electrode; and
a pressure transmitting medium contained in said hermetically sealed housing;
a discharge caused between said thin portion of said movable electrode and said fixed electrode by said drive means acting to expand said pressure transmitting medium in said hermetically sealed housing to slide said thick portion of said movable electrode, and as a result said printing element, in a forward direction in accordance with a volumetic change of said pressure transmitting medium.

4,613,242

DOT MATRIX PRINT HEAD

John L. Forsyth, Greenfield, N.H., assignor to Royden C. Sanders, Jr., Wilton, N.H.

Filed Apr. 17, 1985, Ser. No. 724,627
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **6 Claims**



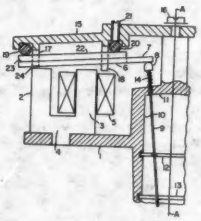
1. A dot matrix print head wherein individual print needles are selectively actuated by individual solenoids; each print needle being carried and driven by an armature carrying spring beam member having a relatively rigid outer section extending from a needle driving end, to which said needle is attached, at least to adjacent the armature, the remainder of said spring beam member being substantially planar to permit ready resilient flexure in the needle driving direction and having a substantially flat planar face, said spring beam member being attached as a cantilever to a support adjacent its end remote from the needle driving end, wherein a second flat planar face spring member overlies the first spring member, said face of the second spring member abutting said face of the first spring member in the area between the armature and the end remote from said needle substantially only when both said spring members are in a rest and in a rebound position, said second spring member being inoperative to bear on said first spring member during most of the print stroke from rest position to print position while providing increased resistance to movement of said first spring member on rebound past the rest position, and the needle driving end of said spring beam member contacting an impact absorbing member substantially only during rest and rebound.

4,613,243

WIRE MATRIX PRINTER WITH DAMPING MEANS

Mario Rossi, Gallarate, and Angelo Gaboardi, Pregnana Milanese, both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Sep. 14, 1984, Ser. No. 650,472
Claims priority, application Italy, Sep. 27, 1983, 23004 A/83
Int. Cl.[4] B41J *3/10*
U.S. Cl. 400—124 **3 Claims**



1. A printing electromagnet group for a dot matrix printer of the kind where a plate shaped movable armature having first and second opposed flat surfaces is attracted by a magnetic core magnetized by a current flowing in an energization circuit and returns to a rest position because of biasing forces applied on said armature, the armature movement being capable of pivoting on a pivotal axis located on the first of said surfaces, a resilient element defining the rest position of said armature and determining the damping of the said armature when said armature contacts said damping means, said damping means comprising a resilient element and:
a non-magnetic plate shaped counterarmature interposed between said armature and said element, said counterarmature having a contact surface with said second surface of said armature and with the full extent of said second surface when said armature is in rest position, said non-magnetic plate shaped counterarmature being pivotable independently from said armature on a pivotal axis located on said second surface and close to the pivotal axis of said armature.

4,613,244

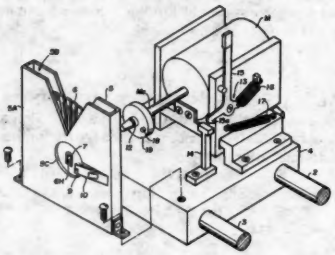
DEVICE FOR MOUNTING PRINTING TYPE ARRAY ON PRINTER

Mitumasa Okabayashi, and Norio Shiga, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,992
Int. Cl.[4] B41J *1/30*
U.S. Cl. 400—175 **11 Claims**

1. In a printing apparatus including a carriage, means for supporting said carriage for reciprocal movement along a linear path, a rotatable disc-shaped printing type array disposed on said carriage and having a center support section

with a central opening and an alignment opening offset to one side of the central opening, drive means disposed on said carriage for rotating said printing type array, said drive means including a rotatable drive shaft, the improvement comprising base pin means for engaging the alignment opening in said printing type array when said printing type array is in a predetermined orientation relative to said carriage, said base pin means including a base pin having an end surface and resilient means for maintaining said base pin in the alignment opening until a force in excess of a first force is applied against the end surface of said base pin, and indexing pin means for moving said base pin out of the alignment opening and engaging the



alignment opening when said printing type array and drive shaft are in a predetermined orientation relative to each other, said indexing pin means including an index pin connected with said drive shaft for rotation therewith, said index pin having an end surface which is engageable with the end surface of said base pin when said printing type array and drive shaft are in the predetermined orientation relative to each other, and means for pressing the end surface of said index pin against the end surface of said base pin with a force which is greater than the first force when said printing type array and drive shaft are in the predetermined orientation relative to each other to move said base pin out of the alignment opening under the influence of force applied against said base pin by said index pin.

4,613,245

DEVICE FOR CONTROLLING THE CARRIAGE RETURN OF A LEAD SCREW DRIVEN PRINTING HEAD

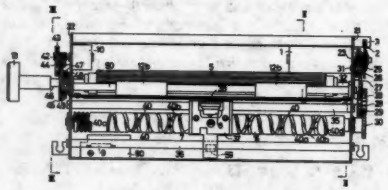
Yoshiaki Ikeda; Yoshio Tamura; Masahiko Nanri, and Yasuki Onizuka, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,751

Claims priority, application Japan, Aug. 22, 1983, 58-152786

Int. Cl.[4] B41J *19/68*

U.S. Cl. 400—313 **8 Claims**



1. A device for controlling the travelling of a printer head, comprising:

a slidably supported carriage having a printing head mounted thereon and having an engagement member;

a lead screw having a helical guide groove formed on its outer peripheral surface, said engagement member slidably engaging with said guide groove, said guide groove comprising first and second helical grooves wound in opposite directions to each other and connected to each other at their respective opposite end portions so as to form a closed loop, said second groove having a pitch larger than that of said first groove;

a reversible carriage motor connected to rotationally drive said lead screw in forward and backward directions of rotation;

carriage motor control means for selectively generating a forward rotation signal for causing said carriage motor to rotate in the forward direction and a backward rotation signal for causing said carriage motor to rotate in the backward direction;

means for detecting the number of characters to be printed by said printing head for each line of print; and

main control means responsive to a print command signal for causing said carriage motor control means to generate said forward rotation signal, said main control means further including means responsive to a return command signal for causing said carriage motor control means to generate either said backward rotation signal or said forward rotation signal, said last-named means determining which of said rotation signals is to be generated in accordance with the position of said printing head along said lead screw, said backward rotation signal being selected when the number of printed characters detected by said detecting means is less than a preset value, said forward rotation signal being selected when the number of printed characters detected by said detecting means is equal to or larger than said preset value.

4,613,246

PRINTER WITH MOUNTING STRUCTURE FOR PRINT HEAD

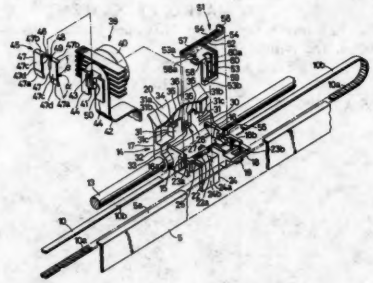
Toshiro Sugiura; Toshiki Morita, and Koichi Takenaka, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 24, 1985, Ser. No. 694,260

Claims priority, application Japan, Jan. 31, 1984, 59-12628[U]; Jan. 31, 1984, 59-12630[U]

Int. Cl.[4] B41J *25/30*

U.S. Cl. 400—320 **14 Claims**



1. A printer having a platen for supporting a sheet of paper, a carriage movable along a length of the platen, a print head carried by the carriage to print characters on the sheet of paper along a line of printing parallel to the length of the platen, and a flexible cable connected to said print head to apply printing signals thereto, comprising:

an endless toothed belt disposed so as to include a linear section movable along said line of printing to drive said carriage, said toothed belt having teeth on an inner surface thereof; and

a serrated portion formed on said carriage and fixedly engaging said teeth of said toothed belt; and

a retainer member supported by said carriage to hold said

linear section of the toothed belt with its teeth in engagement with said serrated portion of the carriage,

said flexible cable being interposed between said retainer member and said linear section of said toothed belt, whereby said flexible cable and said toothed belt are held between said carriage and said retainer member,

said carriage including at least one pair of opposed projections which are spaced from each other in a direction perpendicular to the direction of movement of said carriage so as to define a gap therebetween, said gap being greater than a thickness of said toothed belt but smaller than a width of the toothed belt, said retainer member being forced by said at least one pair of opposed projections toward said serrated portion of the carriage.

4,613,247

MULTIPLE FORMAT KEYBOARD

Roger J. McGunnigle, New York, N.Y., assignor to FWM Enterprises, Inc., Somers, N.Y.

Continuation of Ser. No. 401,913, Jul. 26, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 676,610

Int. Cl.[4] B41J *5/10*

U.S. Cl. 400—486 **18 Claims**

THE PRIMARY OF "PERFECT" FORMAT

1. A multiple format keyboard arrangement adapted for use in a selected one of a number of languages, comprising:

a plurality of manually actuable key members at least some of which correspond to letter and punctuation characters in a given language alphabet, wherein information corresponding to said characters is to be conveyed to information receiving means with which the keyboard arrangement is associated,

key member support means for supporting the character key members in a fixed array of three rows forming a bottom row, a middle row and a top row, each of said rows comprising ten character key members arranged consecutively wherein the first five character key members of each of said rows, proceeding from left to right, are for actuation by fingers of the left hand, the fourth and fifth key members being actuable by the left index finger, and the next five character key members of each of said rows are for actuation by fingers of the right hand, the sixth and seventh key members being actuable by the right index finger,

information conveying means responsive to actuation of said key members for conveying the information corresponding to the characters represented by said character key members to the information receiving means,

character array format selecting means located in the vicinity of said key members for access by an operator, for selecting one of three different character array formats for said character key members wherein at least some of the letter character key members are each caused to correspond to one of at least two different letters in said given language alphabet in accordance with the selected character array format, and said information conveying means conveys the information of the selected letter character to the information receiving means when the corresponding letter character key member is actuated,

a first one of said character array formats which is selectable by said character array format selecting means being a QWERTY format,

a second one of said selectable character array formats being a language adapted touch-type format wherein the ten consecutive character key members of said middle row each correspond to a different one of the ten most frequently used letters in said given language, and wherein the second, third, eighth and ninth of the ten consecutive key members of said middle row, proceeding from left to right, correspond to vowel letters, the remaining ones of said ten key members of said middle row each corresponding to consonant letters, and only the third and the eighth key members of said top row correspond to vowel letters, the two top row vowel letters being those least used in said given language, and

a third one of said selectable character array formats being a high frequency letter cluster format wherein the fourth, fifth, sixth and seventh character key members of the ten consecutive character key members of each of said rows, each correspond to a different one of the twelve most frequently used letters in said given language for selective actuation by the right and left index fingers of the operator's hands, and

character indentifying means for indicating, for each of said character key members, the character to which that key member corresponds in the format selected by said character array format selecting means.

4,613,248

RIBBON LIFT MECHANISM FOR A TYPEWRITER

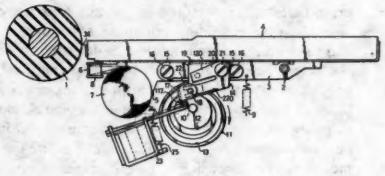
Takayuki Iwase, and Tsuneo Ohashi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 10, 1984, Ser. No. 659,532

Claims priority, application Japan, Oct. 19, 1983, 58-161694[U]

Int. Cl.[4] B41J *11/60, 35/10*

U.S. Cl. 400—697.1 **3 Claims**



1. A typewriter ribbon lifting mechanism comprising:

(a) a printing ribbon located in front of a platen;

(b) a correction ribbon located below said printing ribbon;

(c) a holder supporting said printing and correction ribbons, said holder being tiltable to bring said printing and correction ribbons selectively from their inoperative position to their operative position, while said holder is normally held in its inoperative position;

(d) a cam follower secured to said holder and supporting a follower pin axially movably;

(e) a ribbon lift cam which is rotatable only in one direction to cause said cam follower to tilt said holder, said cam having a first cam groove in which said follower pin is engageable to move said holder to bring said printing ribbon into its operative position, a second cam groove in which said follower pin is engagable to move said holder to bring said correction ribbon into its operative opposition, said second cam groove having a portion coinciding with said first cam groove, while the remaining portion of said second cam groove is greater in depth than said first cam groove, and a land provided between the beginning zones of said first and second cam grooves, said land being continuous to the beginning zone of said first cam groove with the same depth as said first cam groove, said follower pin being slidably in contact with said land, and said beginning zone of said first cam groove being contiguous to said beginning zone of said second cam groove but with a different depth;

(f) means provided on said cam: follower for urging said follower pin toward the bottom of said first and second cam grooves; and

(g) an electromagnetic operable for causing said cam follower to move said follower pin in the radial direction of said ribbon lift cam into engagement with said second cam groove to effect the correction of printing.

4,613,249

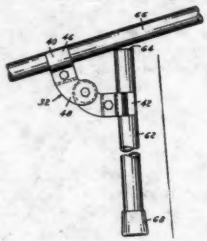
ADJUSTABLE CONDUIT CLAMP

Edward J. Schwartz, Grosse Pointe Woods, Mich., assignor to Fulton Manufacturing Corporation, West Allis, Wis.

Continuation of Ser. No. 586,201, Mar. 5, 1984, Pat. No. 4,529,331. This application Jan. 22, 1985, Ser. No. 693,515

Int. Cl.[4] F16B *1/00*

U.S. Cl. 403—3 **3 Claims**



1. A pipe coupler for holding a plurality of pipes in angularly adjusted positions comprising, in combination:

a pair of pipe clamps each having a pair of cooperating gripping members adapted to clamp a pipe therebetween with the pipe extending completely through the clamps and projecting beyond opposide sides thereof;

said clamps each having a generally L-shaped web portion projection away from the gripping members with the plane of the web lying in the plane of a pipe clamped in the gripping members, said web portions arranged in face-to-face overlapping relation at the ends opposite the gripping members and disposing a pair of pipes clamped in the gripping members in a common plane;

means for pivotally connecting and adjustably clamping the webs;

means for adjustably clamping pipes in the gripping members;

whereby adjustment of both said means enables adjustable projection of pipes gripped by the pipe clamps into pipe abutting relation at any of a wide variety of angular relationships between the pipe so that loading on the pipes is transmitted directly from one pipe to the other.

4,613,250

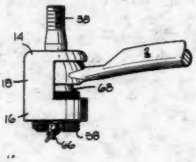
REFURBISHED JOINT AND METHOD FOR REFURBISHING IT

Johnnie Laucus, 631 Grape St., La Junta, Colo. 81051

Filed Mar. 27, 1984, Ser. No. 593,819

Int. Cl.[4] F16D *1/00;* **F16C** *11/06*

U.S. Cl. 403—11 **19 Claims**



1. A refurbished joint comprising:

a hollow housing having an opening in a sidewall thereof for receiving an end of a member;

said member having an opening extending therethrough;

means for retaining said member in a desired relationship with said housing;

a first opening in said housing in alignment with said opening in said member;

a stud extending through said opening in said member and said first opening;

means for providing rotational and pivotal movement between said member and said stud;

means for urging said stud against said member and said member against said housing; and

means for retaining said means for urging, said stud, said member and said housing in an assembled relationship.

4,613,251

BALL JOINT

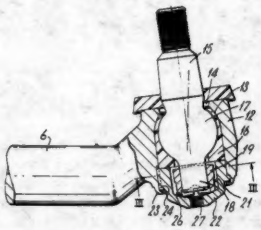
John S. Bellamy, Gwynedd, and Keith D. Elliott, Clwyd, both of Wales, assignors to Quinton Hazell, Wales

Filed Mar. 20, 1985, Ser. No. 713,846

Claims priority, application United Kingdom, Mar. 21, 1984, 8407317

Int. Cl.[4] F16C *11/06*

U.S. Cl. 403—135 **8 Claims**



1. A ball joint at the end of a steering link such as a track rod or drag link of a steering system, in which the spherical head of a ball pin is rotatable in a socket at the end of the steering link, the ball pin having an extension which extends from its spherical surface and engages in a plug having a central aperture said aperture being of rectangular cross section with its greater dimension in a direction axially of the steering link, and a slug of rectangular cross section being fitted on the extension permitting rotation of the extension within the slug, said slug being a close fit within the lesser dimension of the rectangular aperture, but slidable within the greater dimension of the rectangular aperture thereby preventing angular rotation of the joint about an axis along the length of the steering link and constraining angular movement of said extension about a horizontal axis to movement about an axis perpendicular to that of the steering link.

4,613,252

METHOD FOR THE BUILDING OF SEA WAVE POWER PLANTS

Tomas B. Einstabland, Asker; Günnar Aas, Oslo; Nicolay G. Berg, Oslo; Knut Bonke, Oslo, and Ivar Oftebro, Billingstad, all of Norway, assignors to Kvaerner Brug A/S and Ingenior F. Selmar A/S, both of Oslo, Norway

Filed Sep. 24, 1985, Ser. No. 779,453

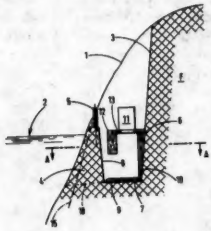
Claims priority, application Norway, Sep. 25, 1984, 843844

Int. Cl.[4] E02B *9/08*

U.S. Cl. 405—76 **5 Claims**

1. A method of building a sea wave power plant of the type in which the power plant must be installed near a steep rock wall to achieve wave reflection, wave build up, characterized in that the installation site is determined inside the rock forma-

tion, at a location which is selected on the basis of optimal wave conditions, spaced from the open rock surface facing the sea, that a well is blasted out from the top of the rock formation to house the generating plant and to serve as a building site,



with a natural rock partition wall separating the well from the sea, whereupon the wave power plant is completed, the generating section installed and finally the well is filled with water and the partition wall removed by blasting, opening the well to the sea.

4,613,253

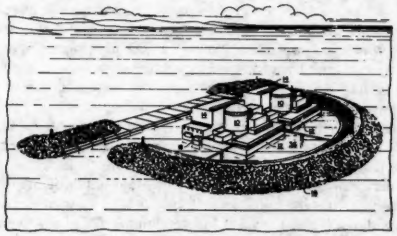
UNDERWATER DISCHARGE SYSTEM

James B. Marshall, Jacksonville, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1984, Ser. No. 607,097

Int. Cl.[4] F16T *1/00*; E02B *17/00*

U.S. Cl. 405—195 **11 Claims**



1. An underwater discharge system for discharging an effluent overboard through an aperture in a wall of an at least partially submersed structure, comprising:

a pressure chamber having a portion thereof constructed to be open to and extend a preselected distance below the surface of the water through which the effluent is to be discharged and having a second portion thereof communicating with the aperture;

a discharge conduit for transporting the effluent, extending from the interior of the structure through the aperture into said pressure chamber and disposed in said chamber to discharge the effluent below the surface level of the water outside said chamber;

means for sealing the wall of said chamber through which said discharge conduit passes to the exterior of said structure; and

means for pressurizing said chamber to maintain the level of the water in said chamber a predetermined level below the elevation in said chamber at which said discharge conduit enters said chamber.

4,613,254

EXPANDING DOWEL WITH SETTING-FORCE INDICATOR

Heinrich Liebig, Wormser Strasse 23, D-6102 Pfungstadt, Fed. Rep. of Germany

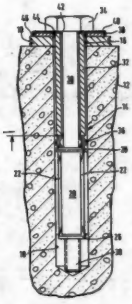
PCT No. PCT/EP84/00059, § 371 Date Sep. 4, 1984, § 102(e) Date Sep. 4, 1984, PCT Pub. No. WO84/03741, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 2, 1984, Ser. No. 648,151

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310001

Int. Cl.[4] E21D *21/02*

U.S. Cl. 405—259 **18 Claims**



1. An expanding bolt anchor to be inserted into a bore, in a ground, comprising: an expanding sleeve divided by longitudinal slits into segments, at least one conical expander, said at least one expander engaging a bore-internal end of the expanding sleeve for expanding the same, a bolt having a bore-internal end engaging the expander and a bore-external end, tighening means on said bore-external end of said bolt, a spacer bushing extending around said bolt and engaging the expanding sleeve, a washer beneath said tightening means for clamping a workpiece against the surface of the ground, and a sleeve-like tube section of a soft steel with a pronounced plastic flow limit, arranged between said tightening means and said expanding sleeve, the tube section having a wall thickness such that, upon application of setting force specific for the bolt anchor, compression stresses will prevail in the tube section which just equal the stresses prevailing in the material of the tube section when the plastic flow limit is reached, the tube section having a hardened thin surface layer in the area which deforms axially when the anchor-specific setting force is attained.

4,613,255

EMBANKMENT STABILIZING BRICK

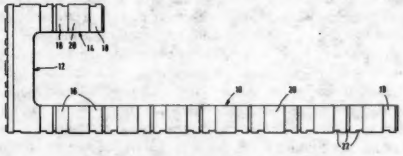
Manfred Bruer, Postfach 63 12 27, D- 6204 Taunusstein 1, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,383

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3313990

Int. Cl.[4] E02D *29/02*

U.S. Cl. 405—286 **5 Claims**



1. An embankmet stabilizing brick of essentially L-shaped

configuration, in plan view, comprising a long leg and an interconnected short leg, and a longitudinally extending stub tongue formed on the free end of said short leg, said stub tongue having a length of at least half the width of the long leg but amounting only to a fraction of the length of said long leg, said long leg and said short leg having a plurality of depressed transversely extending bearing slots on upper and lower bearing surfaces thereof, the length of said slots measured in the longitudinal direction being greater than the width, the space between said stub tongue and said long leg and the spaces between said depressed bearing slots being such that with two identical bricks superposed crosswise, said slots of said long leg and said stub tongue of one brick will engage with said slots of the other brick.

4,613,256

SUPPORTING FRAME

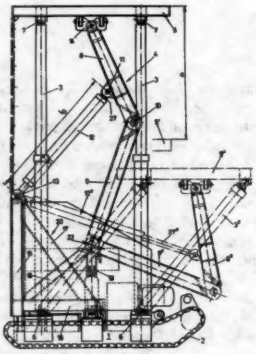
Alfred Zitz, Zeltweg; Karl Lerchbaum, Fohnsdorf; Werner Toferer, Grosslobming, and Heinrich Süssenbeck, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 10, 1984, Ser. No. 680,042

Claims priority, application Austria, Dec. 20, 1983, 4458/83

Int. Cl.[4] E21D *15/44*

U.S. Cl. 405—299 **8 Claims**



1. A movable supporting frame for supporting the roof in underground cavities comprising a base frame, roof cap disposed above said base frame, hydraulic props supporting said roof cap from said base frame and universally pivotally connected at their ends to said roof cap and said base frame, the props being swingable between vertical positions and inclined positions relative to the base frame such that the roof cap is vertically movable within a working area between a raised operating position and a lower operating position upon extension and retraction, respectively, of the props when in their vertical positions and such that the roof cap is also movable to a transport position located below said lower operating position upon swinging of the props in their retracted positions a leminiscate guide including an upper guide arm pivoted at one end to one end of a lower guide arm, means connecting the opposite end of the lower guide arm to the base frame for swivelling movement in transverse direction relative to the plane defined by the upper and lower guide arms, means connecting the opposite end of the upper guide arm to the roof cap for universal movement, a telescopic strut having one end pivoted to the upper guide arm at a location intermediate the ends of the upper guide arm and having an opposite end pivoted to a linking point connected with the base frame, the arrangement being such that the length of the strut remains unchanged during movement of the roof cap between its rasied operating position and its lower operating position and such that the length of the strut increases when the roof cap moves to its transport position.

4,613,257

HYDRAULIC CONTROL ARRANGEMENT

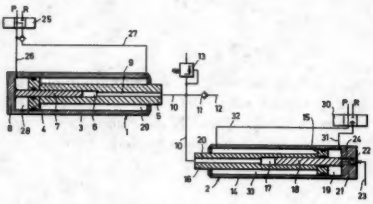
Walter Weirich, Dortmund, and Michael Dettmers, Kamen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,859

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247367; May 21, 1983, 3318641

Int. Cl.[4] E21D *15/14, 23/00, 23/16;* **F15B** *11/20*

U.S. Cl. 405—302 **25 Claims**



1. A hydraulic control arrangement comprising a first hydraulic ram, a second hydraulic ram, and an hydraulic control circuit connected with the first and second hydraulic rams, each of the hydraulic rams having a cylinder, a piston reciprocable within the cylinder, and a hollow piston rod fixed to the piston, and each of the hydraulic rams having a cylindrical working chamber and an annular working chamber positioned on opposite sides of its piston, wherein the hollow piston rod of each hydraulic ram defines a cylinder of a respective metering ram, a respective metering piston being reciprocable within the cylinder of each metering ram to define a metering chamber therewithin, wherein the hydraulic control circuit includes a line, which interconnects the two metering chambers, and a normally closed hydraulic valve positioned in a hydraulic fluid supply line leading to one of the working chambers of the second hydraulic ram, said normally closed hydraulic valve comprising a valve seat and a valve closure member normally seated on the valve seat and closing said valve, and wherein an actuator is coupled to the metering piston of the second hydraulic ram for movement therewith, said actuator being engageable with the closure member of the normally closed hydraulic valve to lift said closure member off said valve seat and open said valve in response to movement of the metering piston of the second hydraulic ram, thereby controlling the flow of hydraulic fluid to said one working chamber of said second hydraulic ram.

4,613,258

APPARATUS FOR SETTING AND REMOVING TUNNEL CASING RINGS

Volker Hentschel, Dorsten-Wulfen, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,585

Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417524

Int. Cl.[4] E21D *11/40*

U.S. Cl. 405—303 **9 Claims**

1. An apparatus for moving casing rings of an interior casing for tunnels, shafts and the like structures in excavating, mining, construction, and the like operations, from a first location to a second location, whereby a casing ring is made of several individual casing segments and the casing rings, when positioned alongside each other, form a respective inner casing,

especially apparatus which is intended for the lining of tunnels with concrete, said apparatus comprising:

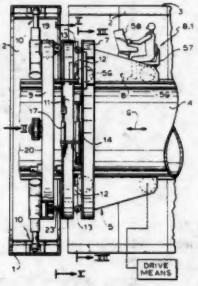
a tubular support bridge structure which can be disposed generally centrally within a casing to be formed in a tunnel;

a transport carriage guided on said support bridge structure, and movable longitudinally along said support bridge structure;

a carriage support ring operatively connected to said transport carriage, said carriage support ring concentrically surrounding said support bridge structure, said carriage support ring lying in a plane substantially perpendicular to a longitudinal central axis of said support bridge structure;

a segment support ring parallel to and disposed ahead of said carriage support ring and connected thereto for cooperation therewith;

a plurality of radially disposed and radially acting adjustment manipulator assemblies mounted on said segment support ring for shifting respective casing segments of a respective casing ring;



a first support ring mounted between said carriage support ring and said segment support ring, said first support ring lying in a plane perpendicular with respect to said longitudinal axis;

means for connecting said first support ring to said carriage support ring, said means including at least a cross guide assembly, and a piston-cylinder assembly for displacing said first support ring on said carriage support ring in two mutually perpendicular directions in a plane perpendicular to said axis;

a second support ring between said first support ring and said segment support ring and provided with means for angularly displacing said second support ring relative to said first support ring about a respective axis of rotation; and

means for connecting said segment support ring to said second support ring, said means including a device for providing a fixed point, and two pendulum piston-cylinder assemblies which are equidistantly spaced from one another and from said fixed point, said pendulum piston-cylinder assemblies serving to tilt said segment support ring relative to said second ring.

4,613,259

APPARATUS FOR CONTROLLING POWDER FLOW RATE IN A CARRIER GAS

Louis L. Packer, Enfield; George S. Bosshart, Vernon; Mark R. Jaworowski, Enfield, and Urban E. Kuntz, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 28, 1984, Ser. No. 675,807
Int. Cl.[4] B65G *53/66*
U.S. Cl. 406—14 **1 Claim**

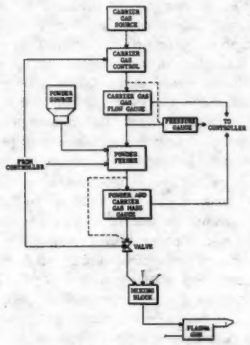
1. A system for controllably delivering a gas stream containing entrained powder and having the capability to continuously vary the quantity of powder in accord with a predetermined schedule, which comprises:

a. flow control means for varying a carrier gas flow in response to a control signal,

b. means for determining the carrier gas mass flow rate and for providing a signal indicative of carrier gas mass flow rate,

c. means for determining the carrier gas pressure and for providing a signal indicative of carrier gas pressure,

d. adjustable feed means for entraining a powder material in the flowing carrier gas,



e. means for determining the radiation transmission through the combined stream of carrier gas and powder and providing a signal indicative of combined mass flow rate,

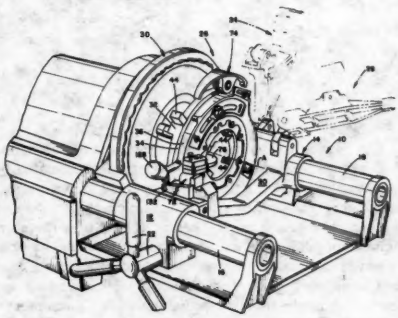
f. means for accepting said carrier gas mass flow signal, said carrier gas pressure signal and said combined mass flow signal and for computing therefrom a powder mass flow value and for comparing said powder mass flow value with a predetermined schedule of powder mass flow values and for controlling said flow control adjusting feeder means so as to comply with said schedule.

4,613,260

THREAD CUTTING DIE HEAD FOR POWER DRIVEN THREADING MACHINES

Robert J. Hayes, Westlake, and Ronald M. Mahl, Avon Lake, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 10, 1985, Ser. No. 732,666
Int. Cl.[4] B23G *1/02, 5/12*
U.S. Cl. 408—74 **41 Claims**



1. An annular thread cutting die head for a power driven

threading machine, said die head having an axis and an entrance end with respect to a workpiece to be threaded and comprising a plurality of thread cutting dies inwardly of said entrance end with respect to the direction of threading a workpiece, annular support plate means supporting said cutting dies for displacement radially inwardly and outwardly of said axis, annular cam plate means coaxial with said support plate means, said support plate means and cam plate means being interengaged for relative pivotal displacement in opposite directions about said axis, said cam plate means including means to displace said cutting dies radially inwardly and outwardly relative to said axis in response to said pivotal displacement in opposite directions about said axis, cam plate biasing interengaging said support plate means and said cam plate means and biasing said cam plate means to pivot about said axis in the direction to displace said cutting dies radially outwardly of said axis, said cutting dies having radially outwardmost positions relative to said axis, first latch means pivotally mounted on one of said support plate means and cam plate means, first keeper means on the other of said plate means, said latch means and keeper means releaseably interengaging said support plate means and cam plate means in a fixed relative angular position therebetween against the bias of said cam plate biasing means and in which angular position said cutting dies are positioned radially inwardly of said outwardmost positions, and said first latch means including actuator means adjacent said entrance end and engaged by a workpiece to disengage said first latch means from said first keeper means as said workpiece approaches said cutting dies in said direction of threading.

4,613,261

ROUTER TOOL

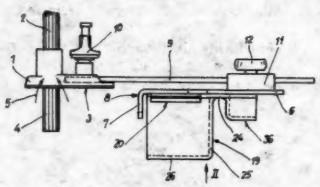
Peter Maier, Gerokstrasse 1, 7311 Neidlingen; Erwin Kutscher, Hohenstaufenstr. 24, 733 Ebersbach-Bünzwangen, and Rolf Knauer, Bergstrasse 9, 7300 Esslingen, all of Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 749,103

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424500

Int. Cl.[4] B23C *9/00*

U.S. Cl. 409—137 **10 Claims**



1. A routing tool comprising a support guide for supporting said tool on a workpiece, a routing bit to be rotated by said tool, said bit extending through an opening in said guide, a dust aspirating means, means for collecting chips, said dust aspirating means being placed at a height at least on a level with the supporting guide, said chip collecting means including a hood mounted on said supporting guide and at a lower level than said supporting guide and having a wall extending approximately circumferentially around part of a circumference of said bit and furthermore said load having a floor in the form of a ramp inclined at such an angle in relation to an axis of rotation of said bit that chips thrown from said bit are deflected upwards by the ramp and removed by said aspirating means.

4,613,262

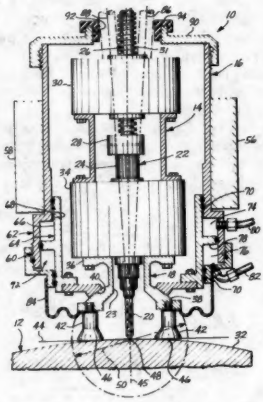
DRILL MOTOR ASSEMBLY WITH GIMBAL NORMALITY AND CLAMP-UP CAPABILITY

Quentin T. Woods, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1984, Ser. No. 687,520

Int. Cl.[4] B23B *39/14*

U.S. Cl. 409—211 **9 Claims**



1. A drilling apparatus comprising:

a drilling member rotatable about an axis for drilling a bore in a workpiece;

drive means for rotating said drilling member and for advancing said drilling member toward and against the workpiece to drill said bore;

an inner housing that receives said drive means and supports said drilling member, and an outer housing that surrounds said inner housing;

a gimbal member connecting said inner housing to said outer housing in a manner so that said inner housing may pivot relative to said outer housing, wherein said gimbal member is fixedly connected to said inner housing, with said gimbal member including a surface having a spherical portion defined by a radius that originates at a drilling point positioned on a datum plane, said datum plane being substantially tangent to said workpiece surface, with said outer housing including a bearing surface shaped to slide adjacent said spherical surface portion so that said gimbal member and said inner housing may pivot relative to said outer housing, to cause said drilling axis to pivot and to remain substantially normal relative to said drilling point while said bore is drilled.

4,613,263

VEHICLE MOUNTED SHIPPING RACK

Charles E. James, St. Cloud, Fla., assignor to FLM Building Products, Inc., Orlando, Fla.

Filed Sep. 11, 1985, Ser. No. 774,988

Int. Cl.[4] B60P *7/10*

U.S. Cl. 410—32 **16 Claims**

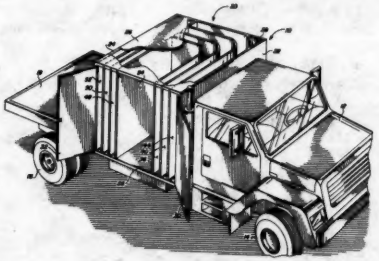
1. A vehicle including a shipping rack for bendable construction materials, such as laminate sheeting and the like, of the type having a length-wise dimension greater than a dimension of said vehicle, comprising:

(a) a vehicular prime mover;

(b) a wheel-supported transport body with said prime mover;

(c) a shipping rack on said transport body, said shipping rack comprising frame means defining plural compartments across said transport body, each compartment having a

dimension longer than a corresponding dimension of said transport body, but each compartment being curved so as to fit within said corresponding dimension; and wherein



(d) said bendable construction materials having a lengthwise dimension greater than said dimension of said transport body may be transported in said shipping rack by bending along said curved compartments.

4,613,264

ANCHOR BOLT

Douglas O. McIntyre, The White Cottage, Heathfields, Royston, Hertfordshire, and Robert W. Limbrick, 6 Meadow Rise, Bewdley, Worcester, both of England

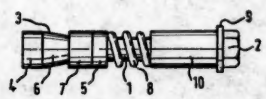
PCT No. PCT/GB82/00234, § 371 Date Apr. 19, 1984, § 102(e) Date Apr. 19, 1984, PCT Pub. No. WO83/03645, PCT Pub. Date Oct. 27, 1983

PCT Filed Jul. 28, 1982, Ser. No. 568,198

Claims priority, application United Kingdom, Apr. 16, 1982, 8211051

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—55 **5 Claims**



1. An anchor bolt for engagement in a socket in a receiving material to clamp an object thereto, comprising a threaded elongate anchor rod having a head, an expansion body threadedly received on the rod in spaced relation to the head and having expanding means drawn into an expansion sleeve to expand the sleeve into gripping contact with the socket as the rod is threaded into the expansion body, the expansion body and the head having opposed spaced abutments, an outer sleeve between said abutments extending around said rod in spaced relation thereto, said outer sleeve being dimensioned to bridge substantially the space between said abutments when said bolt is anchored in said socket and said object is pulled tightly against the receiving material, and spacer means on the rod between the rod and the outer sleeve, said outer sleeve being slidable over at least part of said spacer means during threading of the rod into said expansion body, whereby the space between the rod and the outer sleeve is substantially occupied by said spacer means when said bolt is anchored in said socket.

4,613,265

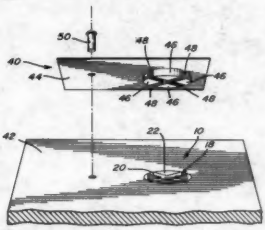
SCREW WITH FILLER-RECEIVING HEAD

Jean-Claude Visinand, 3535 Papineau, Apt. 2405, Montreal, Quebec, Canada H2K 4J9

Filed Mar. 30, 1984, Ser. No. 595,350

Int. Cl.[4] F16B *39/02*

U.S. Cl. 411—83 **6 Claims**



1. A lock member in combination with a screw-type fastener having a threaded shank and a head integral therewith, and adapted to be driven into a structure by axial rotation about its longitudinal central axis in a driving direction such that the head is countersunk, said head being formed with at least two ribs protruding from the surface of the head thereof and extending radially outward from said central axis, said ribs defining a corresponding number of sector-shaped cavities adapted to receive means for engaging said ribs so as to prevent said fastener from axially rotating in a direction opposite said driving direction and to thereby secure said fastener against loosening, wherein said lock member comprises a resilient plate element having on a side thereof facing the structure into which said fastener is driven at least two sector-shaped protuberances arranged in spaced-apart relationship to define a corresponding number of channels adapted to receive the ribs of the head of said fastener with said sector-shaped protuberances fitting into said sector-shaped cavities of said fastener head thereby forming said means for engaging said ribs for locking said fastener in place, and a single pivot means for securing said plate element to said structure, said plate element being sufficiently resilient to permit said plate element to be first bent in a direction away from said structure and clearing said channels and then rotated laterally about said pivot means to allow access to said fastener, and permitting reengagement with said channels by the resilient force exerted by said plate element.

4,613,266

GUIDE APPARATUS FOR USE WITH PUNCHING AND BINDING MACHINES

Roger M. Scharer, Des Plaines, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Nov. 5, 1985, Ser. No. 795,078

Int. Cl.[4] B42B *5/10*; B26D *5/08*

U.S. Cl. 412—40 **11 Claims**

1. A punching and binding machine which includes:

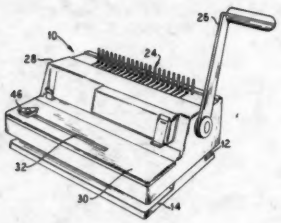
a frame;

a laterally-extending row of punch means carried on the frame for movement with respect to the frame and for punching binding apertures;

cover means carried by said frame which define table means generally aligned with said punch means; and

guide means mounted on said table means for securement in a position to said table means, said guide means having at least one surface that in said secured position is selectively movable between a paper engaging position and a cover engaging position, each of said positions being generally transverse to said row of punch means, and said cover engaging position being laterally and outwardly offset from said paper engaging position;

so that an oversized cover punched using said guide means in the cover engaging position will overlay the edges of



paper punched using said guide means in the paper engaging position with all binding apertures being in registry.

4,613,267

DEVICE FOR THE INTERMEDIATE STACKING OF MATERIAL THAT IS TO BE CUT

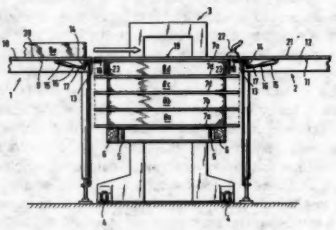
Karl Mohr, Hattersheimer Strasse 11, and Wolfgang Mohr, Hundshager Weg 42, both of D-6238 Hofheim/Taunus, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,745

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 8335816

Int. Cl.[4] B65G *57/09, 59/02*

U.S. Cl. 414—37 **8 Claims**



1. Apparatus for intermediate stacking of material that is to be cut, comprising: a first work station with a jolting table; a fork lift for carrying the material in subdivided stacks with boards between the subdivided stacks; a second work station, said fork lift being located between said first work station and said second station; a cutting machine with a cutting table at said second station; movable stops positioned below supporting surfaces of said tables; said stops having a first position in which said stops are clear of a path of motion of said boards when said boards are raised and lowered; said stops having a second position in which said stops extend into said path and support an uppermost board, said board having a surface defining a plane together with said supporting surfaces of said tables when said stops are in said second position, said stops being located on opposite sides of said board and reach underneath said board on said opposite sides to form said plane and lift said board from the uppermost subdivided stack, said stops serving only to support said board without resisting any forces occurring in said plane aside from frictional forces between said board and said stops; said boards comprising air boards to avoid forces in directions in said plane, so that a subdivided stack on said board supported on one table can be moved unobstructed in said plane toward the other table.

4,613,268

PROCESS AND APPARATUS FOR THE AUTOMATIC SUPPLY OF A MACHINE FOR PROCESSING PRODUCTS IN THE FORM OF SHEETS

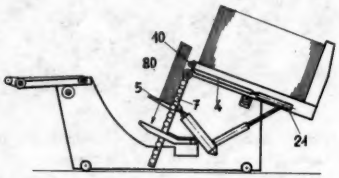
Bernard Capdeboscq, Chaleyssin, and Marc Cuzin, Craponne, both of France, assignors to S.A. Martin, Villeurbanne, France

Filed Mar. 15, 1984, Ser. No. 589,822

Claims priority, application France, Apr. 8, 1983, 83 05985; European Pat. Off., Feb. 3, 1984, 84400238.6

Int. Cl.[4] B65G *59/02, 59/08*

U.S. Cl. 414—114 **19 Claims**



2. A process for the automatic supply of a machine for processing products in the form of sheets, which involves the following operations:

bringing a waiting stack into the upright position,

extracting a bundle of blanks from the top of the stack and positioning this bundle upright on its edge,

dropping this bundle down until it stops, still standing on its edge,

squaring this bundle laterally,

raising the bundle in a movement bringing it approximately to a horizontal position,

discharging this bundle.

4,613,269

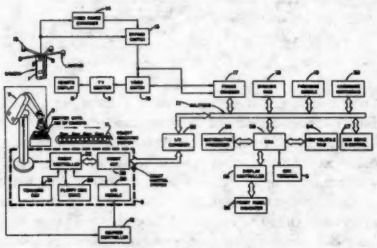
ROBOTIC ACQUISITION OF OBJECTS BY MEANS INCLUDING HISTOGRAM TECHNIQUES

Joseph Wilder, Princeton, and Rajarshi Ray, Plainsboro, both of N.J., assignors to Object Recognition Systems, Inc., Princeton, N.J.

Filed Feb. 28, 1984, Ser. No. 584,539

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—513 **30 Claims**



1. A robot system for acquiring randomly-arranged workpieces, comprising

a robot assembly including a hand, and a controller for controlling the movement of the hand to positions to successively grasp workpieces of given size and transfer them to a predetermined site,

a video imaging device to provide a video signal representing a brightness image of the randomly-arranged workpieces, and

a computer programmed to be responsive to the video signal

from the imaging device and operative to modify the image, to compute a holdsite on a workpiece in the image, and to command the robot assembly to grasp the workpiece and transfer it to said predetermined site,

said video imaging device including a video range expander for selecting and amplifying a range of video signal amplitudes between a gray threshold level and a white clipping level,

said computer including program means to quantize the selected video signal having said range of amplitudes into digital pixels within a plurality of windows all having a size proportional to the size of the workpieces, said means to quantize the selected video signal including means to generate the same number of digital pixels of the image within the window regardless of the size of the window, and to enhance the quantized image by making all pixels having a brightness intensity less than a threshold intensity T equal to zero, and retaining the brightness intensities of all pixels above the threshold T, said threshold intensity T being computed by program from an intensity histogram so that T exceeds the intensity of the most numerous dark pixels by a predetermined fraction of the difference between the intensity of the most numerous dark pixels and the intensity of the most numerous bright pixels.

4,613,270

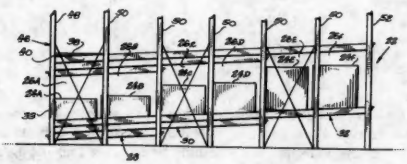
STORAGE RACK HAVING BAYS WITH MULTIPLE RAILS AND INTERLOCKING TROLLEYS

Anthony N. Konstant, Winnetka, and John J. Weider, Arlington Heights, both of Ill., assignors to Speedrack, Inc., Skokie, Ill.

Continuation-in-part of Ser. No. 552,667, Nov. 17, 1983. This application Feb. 6, 1984, Ser. No. 577,182

Int. Cl.⁴ A47F *5/00*

U.S. Cl. 414—276 **14 Claims**



1. A storage rack comprising a plurality of bays, each bay having at least a front storage location and a rear storage location, each bay being adapted to receive at least two loads with the first-received load being movable between said locations, each bay comprising:

an open front entrance end through which said loads can be inserted and removed;

support means including a substantially horizontally disposed supporting surface for supporting a load at said front storage location;

an upper rail means disposed above said supporting surface throughout the length of said first rail means and extending between said storage locations;

a lower rail means extending between said front storage location and a first intermediate storage location, said two rail means being substantially parallel and having substantially identical widths; and

a trolley for carrying said first-received load, said trolley being supported by said rail means and movable on said rail means between said locations whereby both loads can be inserted into said bay at said front storage location, said rail means being inclined downwardly toward said front end so that said trolley is biased by the force of gravity toward said front location, said supporting surface being formed, in part, by a structural member extending transversely with respect to said rail means and disposed remote from the open front entrance.

4,613,271

UNIVERSAL DEVICE TO EMPTY DIFFERENT-STYLE GARBAGE CONTAINERS

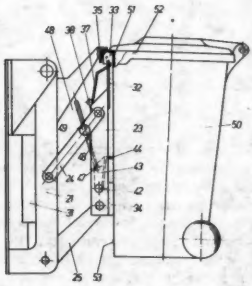
Jakob Naab, Mainz-Laubenheim, Fed. Rep. of Germany, assignor to Zöller-Kipper GmbH, Mainz-Laubenheim, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 728,950

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510168

Int. Cl.⁴ B65G *65/23, 67/04*

U.S. Cl. 414—303 **15 Claims**



1. Device to empty containers of different design, such as garbage containers of different systems, into a pour-in opening by means of a lifting-tilting mechanism which is equipped with carrying elements for holding the container during the emptying process and for gripping the under-sides of existing projecting parts of the container, said lifting-tilting mechanism having an upwardly movable tilt support provided with an abutment adapted for engagement with the container wall, said abutment being mounted so as to be spaced below said carrying elements and said lifting-tilting mechanism having at least one locking mechanism to secure the container against dislodgement of its projecting parts from said carrying elements and pivotal dislodgement of the container wall from the tilt support abutment, characterized in that there is provided on the tilt support **(23)** at least one gripper **(37)** adapted as an additional carrying element and at least one additional locking mechanism **(41)** adapted as a lock, said gripper **(37)** being movable from a gripping position in which it projects from the tilt support **(23)** towards a container **(50, 55, 60)** to a passive, retracted position into which it is elastically received, said additional locking mechanism **(41)** containing at least one locking hook **(44)** which is movably mounted with respect to the tilt support **(23)** and advanceable in the space located between the abutment **(34)** and the gripper **(37)** by means of an actuating mechanism **(46)** controlled by the motion of the tilt support **(23)** whereby said hook **(44)** can be moved during the emptying process into an existing hook seat **(56, 58)** on the container wall at a location opposite to the tilt support **(23)**, and in that said actuating mechanism **(46)** includes a selector means for selectively allowing the locking hook to operate in an operative or an inoperative mode.

4,613,272
METHOD OF OPERATION FOR LOADING A MOTORIZED FLOOR TRUCK AND SUPPORT CARRIAGE THEREFOR

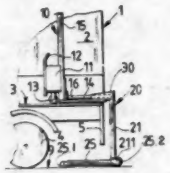
Manfred vom Braucke, Bielefeld, and Hans vom Braucke jun, Vlotho, both of Fed. Rep. of Germany, assignors to Bielefelder Kuchenmaschinen-und Transportgeratefabrik GmbH, Bielefeld, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,245

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403585

Int. Cl.[4] B65G *67/00*

U.S. Cl. 414—347 33 Claims



1. A method for handling a motorized floor truck comprised of a lifting carriage and a support carriage, said lifting and support carriages being mutually independently operable as vehicles, the lifting carriage including load accommodation means which is raisable and lowerable, wherein by operating said carriages cooperatively one can effect alternate raising to a deposit level which is higher than a floor level, and wherein an undercarriage can be driven into position underneath at least an end region of said deposit level; the method comprising the following sequence of operating steps:

raising a load accommodation means of a lifting carriage, and coupling the raised load accommodation means with a support carriage.

lowering the load accommodation means of the lifting carriage which is now coupled with the support carriage, whereby in the process the lifting carriage is lifted to a position above the deposit level;

moving the support carriage along with the lifted lifting carriage until a deposit position is reached;

raising the lowered load accommodation means of the lifting carriage, which load accommodation means is coupled to the support carriage, whereby in the process of such raising the support carriage is lifted;

shifting the position of an undercarriage of the support carriage, and then, after the support carriage has been lifted to an elevation above the deposit level, restoring the position of said undercarriage;

depositing the support carriage onto the deposit surface, by lowering the load accommodation means of the lifting carriage; and

moving the combination of lifting carriage and support carriage, which combination has been deposited on the deposit surface, to the desired final postion, and fixing at least the lifting carriage in place, to prevent further movement.

2. A motorized floor truck operable to raise itself to another level, comprising:

a lifting carriage including a vertical frame having a load accommodation means with an outer width, the load accommodation means being guided in the vertical frame and operable through a vertical excursion, drive means for raising and lowering the load accommodation means; and

a support carriage including an undercarriage with longitudinal beams, each beam having

one end connected to a first crossbeam and a free end,

the longitudinal beams forming a fork having a width between the inner sides of the longitudinal beams at least equal to the outer width of the load accommodation means;

a column-frame disposed generally perpendicular to the undercarriage and including a pair of vertical columns having lower ends and upper ends, the lower ends of the vertical columns being connected to the longitudinal beams, the vertical columnns being connected by a second crossbeam near the upper ends, the height of the vertical columns of the the support carriage being essentially the same as the height of the lifting excursion of the load accommodation means which are guided in a vertical frame of the lifting carriage;

means for accepting the load accommodation means being provided at the upper ends of the vertical columns;

a first rolling support being provided on the free end of each longitudinal beam; and

a second rolling support being provided on the first crossbeam.

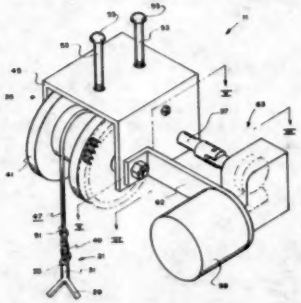
4,613,273
SPARE TIRE HANDLING APPARATUS

John H. Wagner, 504 Academy, Paragould, Ark. 72450

Filed Aug. 27, 1984, Ser. No. 645,036

Int. Cl.[4] B62D *43/04*

U.S. Cl. 414—463 10 Claims



1. An apparatus for lifting and holding a spare tire assembly in a stored position relative to the underside of a vehicle and for lowering said spare tire assembly to a lowered position, said apparatus comprising, in combination:

(a) attachment means attached to said spare tire assembly;

(b) winch means coupled to said attachment means, said winch means including a winch drive shaft;

(c) electric motor means having a selectively rotatable motor drive shaft;

(d) coupling means including a first coupling member attached to said winch drive shaft and a second coupling member operatively coupled to said motor drive shaft for coupling said motor drive shaft to said winch means and for allowing rotational movement to be transferred from said motor drive shaft to said winch drive shaft while allowing longitudinal movement of said winch drive shaft relative to said motor drive shaft; and

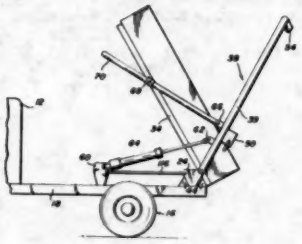
(e) electrical energy means including a source of electrical energy, electrical conductor means electrically coupled to said source of electrical energy and to said electric motor means for allowing the transfer of electrical energy from said source of electrical energy to said electric motor means, and a double pole double throw switch member interposed in said electrical conductor means between said source of electrical energy and said electric motor means for being closed in a first position to cause said motor drive shaft to rotate in a first direction to lift said attachment means and said spare tire assembly to said stored position and for being closed in a second position to cause said motor drive shaft to rotate in a second direction to lower said attachment means and said spare tire assembly to said lowered position.

4,613,274

SELF-LOADING DUMP TRUCK

Bruce E. Stapleton, Route 2, Box 191, Mulberry, Ark. 72947

Filed Feb. 20, 1985, Ser. No. 703,674
Int. Cl.[4] B60P 1/48
U.S. Cl. 414—473 18 Claims



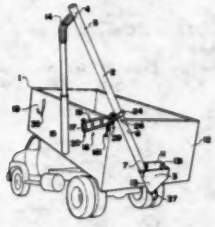
1. A self-loading dump body truck comprising a vehicle having a frame, first and second cross members mounted on said frame, said first cross member being positioned near the rear of said vehicle and said second cross member being positioned forwardly of said first cross member, a cargo box pivotally connected to said first cross member and being supported by said second cross member in a lowered position, an inverted U-shaped boom member pivotally connected to said first cross member, said cargo box and said boom member having a common pivot axis, hydraulic cylinder means for pivoting said boom member with respect to said frame, slide means including a locking box connected to said cargo box and a locking rod connected to said boom member and sliding through said locking box for movement with respect to said cargo box as said boom member is pivoted, and means for selectively connecting said slide means to said locking box for selectively pivoting said cargo box as said boom member is pivoted.

4,613,275

AUGER ARRANGEMENT FOR UNLOADING A TRUCK BOX

Ernest W. Karlowsky, 600 Kilkenny Drive, Winnipeg, Manitoba, Canada R3T 3E1

Filed Jan. 22, 1985, Ser. No. 693,648
Int. Cl.[4] B60P 1/40
U.S. Cl. 414—489 9 Claims



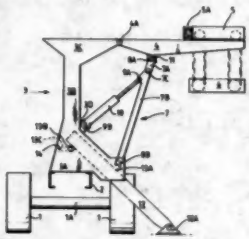
1. An auger arrangement for use in unloading a truck of the type having an elongate tiltable material carrying box with sidewalls and a discharge aperture in a rear wall of said box, said box being tiltable toward the rear wall for discharging material, said auger arrangement comprising an auger tube having a feed end at one end and a discharge duct at an opposed end and being continuous and unseparable therebetween, an auger flight within the tube for rotation relative thereto, a hopper for attachment to the rear wall at said aperture, a motor mounted on said hopper for driving said auger flight when said auger flight is in an operating position, said auger flight being separable from said drive motor and said auger tube being separable from said hopper for movement of said auger tube to a storage position separate from said hopper, said auger flight and said drive motor having cooperable coupling means at the bottom of and within the hopper whereby said tube can be inserted into said hopper and said flight engines with said drive motor, and a support arrangement arranged to move said auger tube from said operating position to said storage position and comprising attachment means for engaging and supporting said auger tube, support means for said attachment means, means for mounting said support means on a sidewall of said truck and swivel means interconnecting said attachment means to said support means, said swivel means being arranged to provide pivotal movement of said auger tube about two axes and said mounting means being arranged to provide pivotal movement of said support means in a direction forwardly and rearwardly of said sidewall whereby said auger tube can be moved such that in said operating position said support means is arranged adjacent the rear edge of the sidewall with said auger tube lying in a plane substantially parallel to said rear wall and extending from said support means to said feed end and in said storage position said support means is moved forwardly from said rear edge such that said auger tube lies substantially wholly along side said sidewall in a plane substantially parallel thereto.

4,613,276

VEHICLE WITH LOAD HANDLING APPARATUS

Michael I. Blatchford, Oakhill, Nr. Shepton Mallet, England, assignor to Ralph Blatchford & Co. Ltd., Midsomer Norton, Nr. Bath, England

Filed Mar. 6, 1984, Ser. No. 586,839
Claims priority, application United Kingdom, Mar. 7, 1983, 8306239
Int. Cl.[4] B60P 1/54
U.S. Cl. 414—542 7 Claims

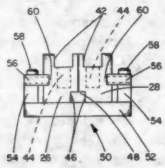


1. A vehicle having load handling apparatus comprising a frame, an upright pedestal on said frame, at least one track arm mounted on said pedestal to be movable from a lower, inoperative position into an upper, operative position, a load-supporting carriage movable on said track arm, a toggle-jointed arm comprising a lower toggle link and an upper toggle link, said upper toggle link being connected at its upper end to said track arm and a hydraulic ram connected at one end to said pedestal and at the other end to said lower toggle link of said toggle-jointed arm for operating said toggle-jointed arm to raise said track arm from the lower, inoperative position to the upper, operative position in which said toggle-jointed arm supports said track arm and a load supported by said carriage on said track arm, wherein the sizes of said ram, and of said upper and lower toggle links are such that when said track arm is in its upper, operative position said toggle-jointed arm is over-center.

4,613,277
ROBOTIC HEAD WITH INTERCHANGEABLE FINGERTIPS

Roger G. Guay, State Road 1163, Apex, N.C. 27502

Filed Apr. 16, 1984, Ser. No. 600,421
Int. Cl.[4] B25J *15/04*
U.S. Cl. 414—729 10 Claims

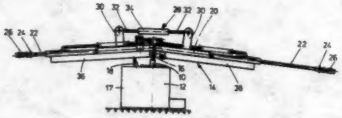


1. A robotic head having interchangeable fingertips for enabling the same robotic head to retrieve and set various types and sizes of elements or parts at one fabricating station and comprising: a robotic head; finger means extending from said robotic head including a plurality of fingers movable back and forth between open and closed position; said finger means including interchangeable fingertip means extending from said fingers for retrieving different size objects, and wherein said fingertip means includes a plurality of fingertip sets with each fingertip set including a pair of fingertips provided with means for retrieving a different size object; said finger means including connecting means for attaching and detaching said respective fingertip sets to and from said finger means; and a fingertip tray including a fingertip retaining side wall structure for receiving and holding a plurality of fingertip sets.

4,613,278
CONVEYOR ROBOT

Alfred Bilsing, Schwedengraben 12, 5952 Attendorn, Fed. Rep. of Germany

Filed Aug. 30, 1983, Ser. No. 527,761
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 8225377[U]
Int. Cl.[4] B66C *23/00*
U.S. Cl. 414—736 5 Claims



1. A conveyor robot, especially for press interlinkage, comprising:

a stationary base;

a continuous arm member extending on opposite sides of said base;

rotation means for mounting said continuous arm member to said base for rotation about a single vertical axis;

swing means for mounting said continuous arm member to said base for oscillation about a single horizontal axis;

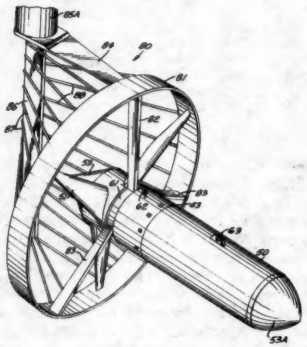
said continuous arm member including (a) a pair of elongate arms extending in opposite, generally horizontal directions, (b) a respective engaging member attached to a respective said elongate arm, each said engaging member being extendable from a respective said elongate arm independently of the other said engaging member, and (c) an articulation joint which joins said elongate arms to each other and which allows one said elongate arm to pivot independently about a single horizontal axis relative the other said elongate arm;

whereby by appropriate adjustment of said elongate arms about said articulation joint and of said swing means, said elongate arms at different heights are rotatable 180° by said rotation means to the height of the other arm and back again to the original positions.

4,613,279
KINETIC HYDRO ENERGY CONVERSION SYSTEM

Dean R. Corren, and Gabriel Miller, both of New York, N.Y., assignors to Riverside Energy Technology, Inc., New York, N.Y.

Filed Mar. 22, 1984, Ser. No. 592,325
Int. Cl.[4] F03B *3/12*
U.S. Cl. 415—2 A 11 Claims

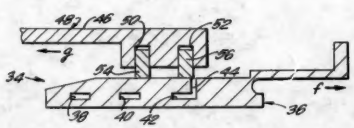


1. In a kinetic hydro energy conversion system having a turbine with a rotor including a cylindrical hub and blades having one end fixed to the hub, wherein the rotor rotates about an axis of rotation corresponding to the central axis of the hub, wherein each blade has an airfoil profile at any section thereof between the ends of the blade with a twist angle and chord length defined in accordance with Glauert equations, the improvement wherein the airfoil profile for each blade section disposed at a distance from the axis of rotation lies on the surface of a cylinder having its center at the axis of rotation and its radius equal to said distance from the axis of rotation, whereby the airfoil profiles will be aligned with the direction of rotation motion of the blades.

4,613,280
PASSIVELY MODULATED COOLING OF TURBINE SHROUD

Michael J. Tate, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Sep. 21, 1984, Ser. No. 653,036
Int. Cl.[4] F01D *25/12, 21/00*
U.S. Cl. 415—17 6 Claims



1. A turbine engine having a rotatable turbine assembly, a generally cylindrical shroud disposed concentrically around at least a portion of said turbine assembly and a sealing ring disposed generally concentrically around said shroud, said shroud being provided with at least one cooling air passage extending therethrough and at least one cooling air inlet extending into said at least one cooling air passage, said sealing

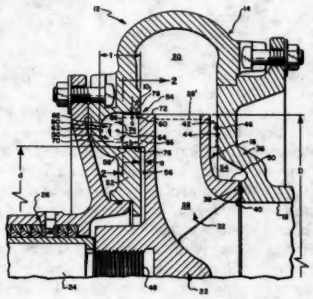
ring and said shroud being axially movable with respect to each other, said at least one cooling air inlet being dimensioned and positioned with respect to said sealing ring such that under at least certain operating conditions of said engine said sealing ring moves relative to said shroud to block said at least one cooling air inlet.

4,613,281

HYDRODYNAMIC SEAL

Valdemar M. Lubieniecki, Skaneateles, N.Y., assignor to Goulds Pumps, Incorporated, Seneca Falls, N.Y.

Filed Mar. 8, 1984, Ser. No. 587,594
Int. Cl.[4] F04D *29/08*
U.S. Cl. 415—170 B 21 Claims



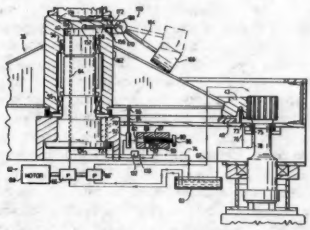
1. A fluid pump comprising a casing means defining a pumping chamber in communication with a fluid inlet opening and a fluid outlet opening, and an annular vortex chamber opening into said pumping chamber; an impeller rotatably supported within said pumping chamber and having pumping vanes on a front surface thereof for pumping fluid between said inlet and outlet openings incident to rotation of said impeller, said vortex chamber is bounded by outer and inner walls disposed essentially concentrically of the rotational axis of said impeller and an annular wall joining ends of said outer and inner walls arranged remotely of said pumping chamber, wherein said vortex chamber opens axially relatively towards a rear surface of said impeller; and a repeller mounted for rotation with said impeller adjacent said rear surface, and said repeller is received within said vortex chamber and cooperates therewith for creating a toroidal flow of fluid within said vortex chamber incident to rotation of said impeller to provide a hydrodynamic seal, said repeller comprising a plurality of blades cooperating to define flow passages extending between radially outer and inner ends thereof and having rearwardly disposed edges spaced from said annular wall surface to axially bound therebetween an open portion of said vortex chamber, said open portion is free of any internal obstruction which might impede said toroidal flow of fluid, and means extending into said vortex chamber for limiting flow communication between said open portion and said pumping chamber to outer and inner flow passageways arranged adjacent said outer and inner walls and extending axially past said radially outer and inner ends of said blades, respectively, in a direction towards said pumping chamber.

4,613,282

GEAR CONNECTION AND BRAKE ASSEMBLY

Charles F. Wood, Mississauga, Canada, assignor to Indal Technologies Inc., Mississauga, Canada

Filed Dec. 28, 1979, Ser. No. 107,933
The portion of the term of this patent subsequent to Apr. 23, 2000, has been disclaimed.
Int. Cl.[4] F03D *7/06*
U.S. Cl. 416—36 32 Claims



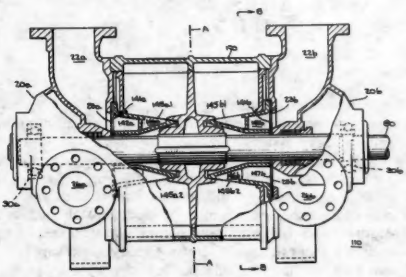
1. A braking system for a vertical axis wind turbine, having a bull gear and base for supporting the bull gear, the bull gear and base presenting a hollow housing and shaft, the housing for receiving the shaft, one of the said hollow housing or shaft being stationary and the other being rotatable and secured to the bull gear, and brake pads disposed between the bottom of the bull gear and base, a space between the housing and shaft when the shaft is received in the housing for receiving hydraulic fluid injected therein under pressure to free the bull gear and vertically support it relative to the base for rotation, and hydraulic circuitry to feed hydraulic fluid into, and drain fluid from the space.

4,613,283

LIQUID RING COMPRESSORS

Harold K. Haavik, South Norwalk, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Jun. 26, 1985, Ser. No. 748,821
Int. Cl.[4] F04C *19/00*
U.S. Cl. 417—68 9 Claims



1. A liquid ring compressor comprising:
an annular housing;
a quantity of pumping liquid maintained in the housing;
a rotor rotatably mounted in the housing and having a plurality of circumferentially spaced, radially extending blades for engaging the pumping liquid and forming it into a recirculating annular ring inside the housing, the housing being shaped to cause the inner surface of the liquid ring to diverge from the rotor axis in the direction of rotor rotation at two circumferentially spaced intake zones of the pump and to converge toward the rotor axis in the

direction of rotor rotation at two circumferentially spaced compression zones of the pump, the intake and compression zones alternating circumferentially of the pump; and

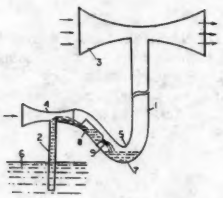
an annular port member concentric with the rotor and extending into an annular recess in a first axial end of the rotor, the port member containing an intake passage adjacent a first axial end of the port member and a discharge passage adjacent an opposite second axial end of the port member, the one of said passages which is adjacent the end of the port member which projects farther into the annular recess also including a portion adjacent the other axial end of the port member, the port member including partitions for isolating the intake and discharge passages from one another, and the port member further including (a) a gas inlet opening in the first axial end of the port member for admitting gas to be pumped to the intake passage, (b) two intake ports through the outer surface of the port member in communication with the intake passage, each intake port being adjacent a respective one of the intake zones for admitting gas from the intake passage to the associated intake zone, (c) two discharge ports through the outer surface of the port member in communication with the discharge passage, each discharge port being adjacent a respective one of the compression zones for discharging compressed gas from the associated compression zone to the discharge passage, and (d) a gas discharge opening in the first axial end of the port member for discharging compressed gas from the discharge passage.

4,613,284

APPARATUS FOR ELEVATING LIQUIDS INCLUDING A VENTURI PIPE AND A LIQUID DELAY ELEMENT

Iosif Baumberg, 54 Bay 29 St., Brooklyn, N.Y. 11214

Filed Sep. 3, 1985, Ser. No. 771,908
Int. Cl.[4] F04B *23/04;* F04F *5/00*
U.S. Cl. 417—76 **9 Claims**



1. A wind pump, comprising

a supply pipe having a lower end to be immersed into liquid, and an upper end;

a substantially horizontal Venturi pipe having a constriction connected with said upper end of said supply pipe, an inlet diffuser for entering wind, and an outlet diffuser;

a convex pipe having an inlet connected with said outlet diffuser of said Venturi pipe, and an outlet so that a liquid is drawn from the liquid source through said supply pipe and said Venturi pipe into said convex pipe;

a delivery pipe having a lower end connected with said convex pipe and an upper end;

pumping out means connected with said upper end of said delivery pipe and forming rarification in the latter so as to elevate the liquid through and discharge the liquid from said delivery pipe, said liquid being raised in said delivery pipe in the form of a composite column of liquid portions and air;

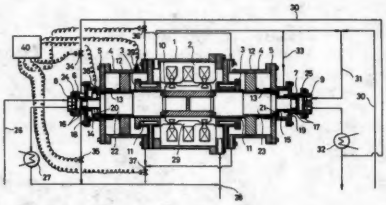
and liquid supply delaying means located within said convex pipe between said outlet diffuser of said Venturi pipe and a bottom curve of said convex pipe and arranged to accumulate a part of the liquid flowing from said supply pipe into said convex pipe, and when a cross section of said convex pipe is not completely filled with the liquid, to supply the accumulated part of the liquid into said convex pipe so as to completely fill the cross section of said convex pipe.

4,613,285

PISTON STROKE CONTROL DEVICE FOR FREE PISTON TYPE OSCILLATING COMPRESSORS

Eiji Sato; Tamio Fukuda; Masaharu Ishii; Mitsuru Nakamura, and Yozo Nakamura, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1985, Ser. No. 719,146
Claims priority, application Japan, Apr. 2, 1984, 59-63306
Int. Cl.[4] F04B *25/02, 49/00;* F01B *31/00*
U.S. Cl. 417—214 **10 Claims**



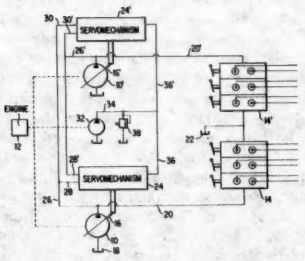
1. In a free piston type oscillating compressor having a free piston which reciprocates owing to oscillating force of a linear motor, bearings which support the free piston, gas springs which cause the free piston to resonate, and compression chambers; a piston stroke control device for a free piston type oscillating compressor; wherein separate hermatically sealed pressure spaces are provided on each side of said linear motor, and means communicating with said pressure spaces for controlling the pressure of each pressure space and the central position of the stroke of said free piston so as not to deviate to one side.

4,613,286

CONSTANT TORQUE CONTROL SYSTEM FOR A VARIABLE DISPLACEMENT PUMP OR PUMPS

Katsuji Ishikawa, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,798
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—216 **8 Claims**



1. A constant torque control system for at least one variable displacement pump operating under a variable load, said control system consisting of a servomechanism for varying the displacement of the variable displacement pump and a fixed displacement pump supplying fluid under pressure to said servomechanism, the servomechanism comprising:

(a) a housing;

(b) a servoactuator section for acting directly on the variable displacement pump, the servoactuator section comprising:

(1) a servopiston slidably mounted in the housing so as to define a pair of opposed fluid chambers and operatively coupled to the variable displacement pump for varying the displacement thereof in response to fluid pressure supplied to the fluid chambers; and

(2) resilient means acting on the servopiston for normally holding the variable displacement pump at a maximum displacement;

(c) a servovalve section for controlling communication between the fixed displacement pump and the pair of fluid chambers of the servoactuator section, the servovalve section comprising:

(1) a servovalve spool slidably mounted in the housing for selectively placing the pair of fluid chambers of the servoactuator section in and out of communication with the fixed displacement pump and with a fluid drain;

(d) a control section responsive to the variable fluid pressure from the variable displacement pump for controllably actuating the servovalve section, the control section comprising:

(1) control piston means slidably mounted in the housing for displacement in a first direction in response to the variable fluid pressure from the variable displacement pump; and

(2) multiple spring means for biasing the control piston means in a second direction opposite to the first direction and normally holding the control piston means in an extreme position in the second direction, the multiple spring means comprising at least two springs adapted to vary a total spring constant thereof when the control piston means reaches a predetermined position intermediate the opposite extreme positions thereof in the first and second directions, wherein said multiple spring means comprises a first helical compression spring constantly acting on the control piston means regardless of the position of the latter relative to the housing to bias the control piston means in the second direction, a second helical compression spring arranged concentrically with the first helical compression spring and having one end butting on the control piston means, and a spring seat on which the other end of the second helical compression spring butts when the control piston means travels to the predetermined position in the first direction against the bias of the first helical compression spring, the first and second helical compression springs cojointly resisting the travel of the control piston means in the first direction past the predetermined position and means for adjustably varying the position of the spring seat of the multiple spring means toward and away from the control piston means; and

(e) a control lever having a pair of opposite ends operatively engaging with the servopiston of the servoactuator section and with the servovalve spool of the servovalve section and medially pivoted to the control piston means of the control section, the control lever being effective to move the servovalve spool in response to the movement of the control piston means in order to cause displacement of the servopiston in response to fluid pressure from the fixed displacement pump, and being further effective to feed back the displacement of the servopiston to the servovalve spool, thereby controlling the displacement of the variable displacement pump in accordance with the variable fluid pressure output thereof.

4,613,287

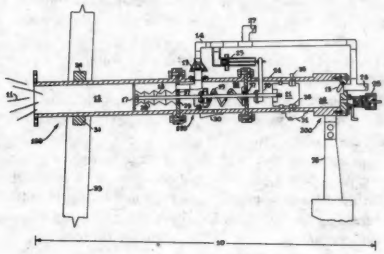
WAVE OPERATED ENERGY DEVICE

Charles C. Hambley, c/o The Evergreen Pier, H.C.R. Box 16195, Merizo, Guam 96916

Filed Jan. 31, 1985, Ser. No. 697,083

Int. Cl.[4] F04B *35/00*

U.S. Cl. 417—330 **8 Claims**



1. A wave operated energy apparatus, comprising;

a generally elongated cylindrical first stage energy receiving chamber, having an outwardly biased ram disc positioned in its forward section and exposed to oncoming waves, and a high compression piston formed in its rearward section, wherein the ram disc and high compression piston are operatively connected via an elongated ram rod;

a high compression stage comprising a high compression chamber, in which the said high compression piston is slidingly disposed, wherein the rearward face of the said piston defines the forward wall of the said high compression chamber and said high compression chamber has an inlet and an outlet; and piping between said first stage energy receiving chamber and said high compression chamber, said piping having vent means, and valve means to control said vent means, said piping arranged to allow passage of air entrapped in front of an oncoming wave to flow around the ram disc and into the rearward end of said high compression chamber.

4,613,288

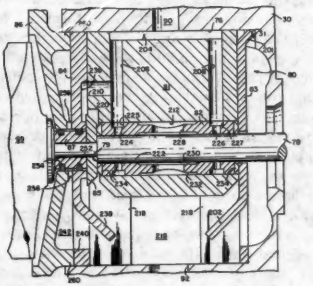
TURBOCHARGER

Charles E. McInerney, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 26, 1983, Ser. No. 498,228

Int. Cl.[4] F04B *17/00;* **F16C** *33/10*

U.S. Cl. 417—407 **61 Claims**



1. A turbocharger comprising:

a turbine having a turbine wheel carried within a turbine housing and rotatably driven by exhaust gases from an internal combustion engine;

a compressor having a compressor wheel carried within a compressor housing and rotatably driven by said turbine for supplying charge air to the internal combustion engine;

a common shaft connected between said turbine wheel and said compressor wheel;

a center housing connected between said turbine housing and said compressor housing around said common shaft and including bearing means to rotatably support said common shaft;

said turbine housing having an open volute and a generally disk-shaped heat shield to close the open volute and also including a plurality of bolt openings therein; and said compressor housing having an open volute and a thrust-diffuser plate closing the open volute;

an annular ring disposed around said compressor housing and including a plurality of bolt openings therein aligned with the bolt openings in said turbine housing; and

a plurality of bolts extending between said turbine housing and said annular ring in the openings therein.

4,613,289

CORROSION RESISTANT PUMP

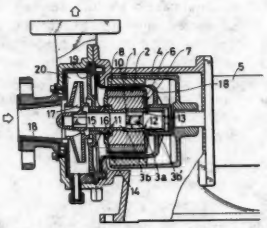
Masayuki Kotera, Osaka, Japan, assignor to Seikow Chemical Engineering & Machinery, Ltd., Japan

Filed Jun. 11, 1985, Ser. No. 743,572

Claims priority, application Japan, Mar. 4, 1985, 60-42509

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—420 **3 Claims**



1. A corrosion resistant pump comprising a drive magnet rotatable by a motor, a driven magnet rotatable by the rotation of the drive magnet, an annular yoke having the driven magnet attached to its outer peripheral surface, a covering layer of corrosion resistant synthetic resin formed over the driven magnet-yoke assembly and defining a shaft bore in the center of the assembly, and a pump rotary shaft extending through the shaft bore of the assembly and fittingly connected to the assembly, the rotary shaft having an impeller at its front end, the pump being characterized in that the shaft bore defined by the corrosion resistant covering layer of the driven magnet-yoke assembly and the rotary shaft are provided, where the shaft is fitted in the bore; with shaft drive connecting means comprising a bored portion and a shaft portion fitting therein, the bored and shaft portions having a cross sectional form other than a circular form, and a plurality of shaft fixing means aligned with each other and with the shaft drive connecting means axially of the rotary shaft and each comprising a bored portion and a shaft portion tightly fitting in the bored portion, the shaft fixing means in the rear being diametrically larger than the shaft fixing means in the front, the diametrically larger shaft fixing means including stepped stopper means for holding the shaft portion thereof to the bored portion thereof against axial displacement.

4,613,290

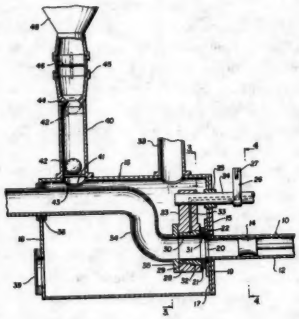
EVACUATED PUMPING SYSTEM

William R. Evenson, South Houston, Tex., assignor to Lefco Western, Inc., Houston, Tex.

Filed Apr. 23, 1984, Ser. No. 602,927

Int. Cl.[4] F04B *15/02, 7/00*

U.S. Cl. 417—517 **1 Claim**



1. A pumping system for viscous flowables comprising a closed tank hopper, an inlet suction line for viscous flowables connected into the top of the closed tank hopper and extending to a supply of a viscous flowable, a delivery line for viscous flowables connected into the closed tank hopper and extending therefrom to a point of consumption or storage for viscous flowables, an oscillatable elbow disposed within the closed tank hopper and being connected with said delivery line, a dual cylinder alternating piston pump connected with one wall of the closed tank hopper and having its cylinder bores in communication with the interior of the closed tank hopper, power means connected with said oscillatable elbow to swing the same into alternating registration with the cylinder bores of the dual cylinder alternating piston pump, a vacuum pump separate from and operating independently of the dual cylinder alternating piston pump and disposed exteriorly of the closed tank hopper, and a vacuum conduit means connected between the top of the closed tank hopper and said vacuum pump and including a vertical pipe section rising from the top of the closed tank hopper, a floatable one-way active check valve element within the vertical pipe section and being engageable with a valve seat therein to block the passage of viscous flowables in the closed tank hopper to the vacuum pump, a vacuum shut-off valve in the vertical pipe section, and a filter means in said vacuum conduit means.

4,613,291

INLET CONSTRUCTION FOR A SCROLL COMPRESSOR

Fred S. Sidransky, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1985, Ser. No. 761,483

Int. Cl.[4] F01C *1/04;* **F04C** *18/04*

U.S. Cl. 418—15 **7 Claims**

1. A compressor comprising:

first and second scrolls each having a generally spiral-like vane having radially inner and outer ends and a plurality of wraps therebetween, the vanes on said scrolls interfitting to define a plurality of traveling pockets in which a fluid to be compressed may be received;

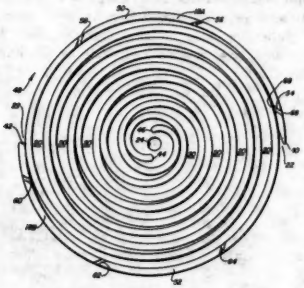
a central fluid outlet in at least one of said scrolls adjacent the radially inner ends of said vanes;

the radially outer ends of said vanes serving as an inlet to said compressor;

means mounting one of said scrolls for orbiting movement with respect to the other such that said pockets travel from said inlet to said outlets;

means for orbiting said one scroll; and

at least one fluid through passage in each of said vanes in the outermost wrap thereof in relative proximity to the corresponding radially outer end and extending between the radially outer and radially inner surfaces of the associated vane.



4,613,292

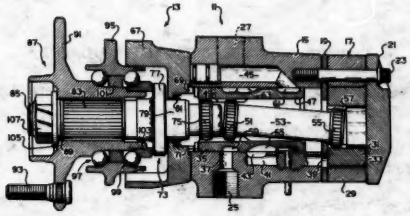
HYDRAULIC MOTOR HAVING FREE-WHEELING AND LOCKING MODES OF OPERATION

Marvin L. Bernstrom, and Steven J. Zumbusch, both of Eden Prairie, Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 1, 1985, Ser. No. 697,596

Int. Cl.[4] **F03C** *2/08;* **F04C** *2/10;* **B60K** *17/356;* **F16D** *41/00*

U.S. Cl. 418—61 B **51 Claims**



1. A rotary fluid pressure device of the type including housing means defining a first fluid port, a second fluid port, and a valve bore; a gear set associated with said housing means and including a first toothed member and a second toothed member operatively associated with said first toothed member for relative movement therebetween, the teeth of said members interengaging to define expanding and contracting fluid volume chambers during said relative movement, one of said toothed members having rotational movement about its own axis; output shaft means extending from said housing means and rotatably supported thereby; a generally cylindrical valve spool rotatably disposed within said valve bore; drive shaft means operable to transmit said rotational movement of said one of said toothed members into rotational movement of said valve spool, said drive shaft means cooperating with said valve spool to define a first connection means; said valve spool, in its normal, operating position, and said housing means cooperating to define first fluid passage means communicating between said first fluid port and said expanding volume chambers, and second fluid passage means communicating between said contracting volume chambers and said second fluid port; said output shaft means cooperating with said valve spool to define second connection means operable to transmit said rotational movement of said valve spool to said output shaft means with said valve spool in said normal, operating position; characterized by:

(a) said first connection means being operable to permit axial movement of said valve spool relative to said drive shaft means, and one of said first and second connection means being operable to permit axial movement of said valve spool from said normal, operating position to a free-wheel position in which said one of said first and second connection means is disengaged; and

(b) actuation means operable to effect axial movement of said valve spool between said normal, operating position and said free-wheel position to achieve free-wheeling operating of said rotary fluid presssure device.

4,613,293

BELT-TYPE PRESS FOR MAKING PARTICLEBOARD, FIBERBOARD, AND LIKE PRESSEDBOARD PRODUCTS

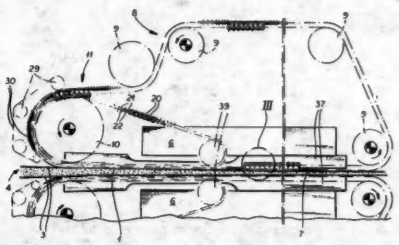
Klaus Gerhardt, Rheûrdt, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 767,955

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432548

Int. Cl.[4] **B30B** *5/06;* **B29D** *7/14;* **A23G** *1/20*

U.S. Cl. 425—371 **8 Claims**



1. In a belt-type press for making fiberboard, particleboard, and the like pressedboard products comprising an endless upper press belt circulated over at least one upper belt guide roller, a corresponding endless lower press belt circulated over at least one lower belt guide roller, said upper and lower press belts forming a pressing gap in a pressing region, and a press framework having lower and upper platens as well as a drive mechanism, whereby in said pressing region between each of said upper and lower platens and the corresponding one of said upper and lower press belts a rod container is positioned from which a plurality of rolling rods are fed with spacing from each other, and are guided by one of an upper and lower rod circulating mechanism, wherein said upper and lower rod circulating mechanism each comprise two first chains each guided over at least one sprocket and at least one first chain drive wheel, a plurality of interlinked chain link members having a plurality of chain bolts, a plurality of running rollers mounted on said chain bolts, and at least one guide rail for said running rollers, said rolling rods being attached between said two first chains with equalizing free play, at least one end of each of said rolling rods having a recess bored therein, in which one of a plurality of support bolts attached to one of said first chains engages so as to provide said equalizing free play, and wherein in an entrance region of said pressing gap and of said upper and lower platens upper and lower second chain each having a plurality of chain rollers in a triangular configuration, each of said second chains being guided over at least one second chain guide wheel, are positioned, said rolling rods between said first chains being guided on said chain rollers similar to roller bearings, the improvement wherein

each of said chain link members is provided with at least one rolling rod holder on the end of said chain link member furthest from said guide rails and closest to said press belts

in said pressing region, said rolling rod holder allowing said equalizing free play,

said first chains have a chain bolt play between said chain bolts and said chain link members, and

said second chains being set up as aligning means for said rolling rods to be aligned perpendicularly to the circulating direction of said rolling rods, and are constructed so as to be partly flexible with compensating play.

4,613,294

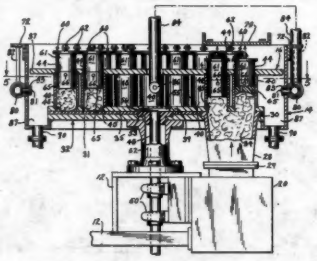
ROTARY CHEESE MOLDER WITH IMPROVED COOLING

Scott J. Rose, Columbus; Rodney J. Huettner, and George H. Hall, both of Beaver Dam, all of Wis., assignors to Stainless Steel Fabricating, Inc., Columbus, Wis.

Filed Jul. 29, 1985, Ser. No. 760,323

Int. Cl.[4] A23C *3/04*; B29C *31/04*

U.S. Cl. 425—438 **8 Claims**



1. A rotary cheese molder for consumer size cheese pieces, comprising:

a stationary cooling head having enclosed sides and a bottom wall, said bottom wall having a fill opening and a discharge opening;

a mold body within the stationary head, said mold body including:

an upper plate;

a lower plate spaced beneath the upper plate, said upper and lower plates having a common vertical axis;

a plurality of vertically oriented mold sleeves, each of said sleeves extending between the upper and lower plates and being arranged in a circular pattern which overlaps the fill and discharge openings; and

wherein the lower and upper plates have openings to provide communication through the sleeves from the bottom of the mold body to the top;

means for rotationally driving the mold body to move the sleeves in succession over the fill and discharge openings;

an extruder for delivering warm plastic fluid cheese to the fill opening to fill the mold sleeves as they pass over the fill opening;

a manifold pipe around the periphery of the mold body to spray cooling liquid on the sleeves between the upper and lower plates;

a central pipe extending into the central portion of the mold body to spray cooling liquid on the sleeves between the upper and lower plates; and

means for pumping the cooling liquid through the manifold and central pipes; and

wherein the cooling liquid partially cools the cheese in the sleeves before the cheese reaches the discharge opening and collects in the cooling head to be recirculated through the manifold and central pipes by the pumping means.

4,613,295

MOLDING APPARATUS WITH SENSOR MEANS

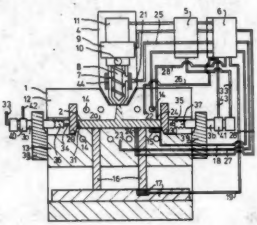
Reinhard Hüppe, Berlin; Helmut Käufer, Metzkausen, and Hans J. Lemke, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 420,653, Sep. 21, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 646,024

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138432

Int. Cl.[4] B29C *45/26*

U.S. Cl. 425—542 **1 Claim**



1. In an injection molding apparatus having two coopeerating mold halves defining a mold cavity, a first of said halves having an injection part, the improvement comprising: sensor means adjacent one of said mold haves and movable into contact with a molded product within the mold when said mold halves are in separated position the first mold half having insert means movable therewith to give access to said product by said sensor means when the mold halves are in said separated position, said insert means blocking access to said mold cavity and said product by said sensor means when said mold halves are in closed position.

4,613,296

DEVICE FOR TIGHTENING A COIL ON A CYLINDRICAL BODY

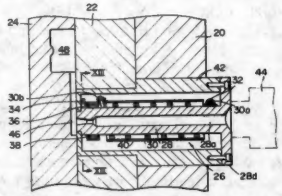
Yasumasa Nagasaka, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1985, Ser. No. 739,273

Claims priority, application Japan, May 31, 1984, 59-81388[U]; Jul. 3, 1984, 59-100561[U]

Int. Cl.[4] B29F *1/03*; F27B *14/00*

U.S. Cl. 425—547 **1 Claim**



1. An injection moulding system comprising:

an injector for generating a flow of molten material;

a mould assembly defining a cavity corresponding to a product to be produced, and a passageway for connecting the injector with the cavity; and

at least one heater assembly arranged adjacent to the passageway for heating the melt passing through the passageway; said heater assembly comprising:

a cylindrical body having a hole extending longitudinally therethrough constructing at least a part of the passageway;

a coil arranged around the cylindrical body, the coil having an original diameter slightly larger than that of the cylindrical body, the coil being made from a sheathed heater wire, said coil having stopper portions at its ends, which stopper portions are formed on the sheath of the wire;

first anchor means for engaging with the first stopper portion and for connecting the first end portion of the coil to the cylindrical body;

a ring member arranged around the cylindrical body at a position axially remote from the first anchor means, said ring member being rotatable with respect to the cylindrical body;

second anchor means arranged on the ring member for engaging with second stopper portion and for connecting the second end portion of the coil to the ring member;

means for rotating the ring member about an axis of the cylindrical body so that the second end portion of the coil is circumferentially moved with respect to the cylindrical body whereby the coil portion is tightened around the cylindrical body;

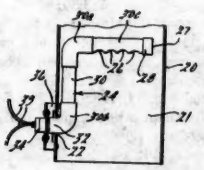
a cover of tubular shape arranged around the coil; and

means for tightening the cover so that the coil is closely arranged between the cover and the cylindrical body.

4,613,297
VENT FLOW MONITOR

Theodore J. Zanias, Huntington Beach, and Elwood M. Fairchild, Los Angeles, both of Calif., assignors to Masco Corporation, Taylor, Mich.

Filed Sep. 17, 1984, Ser. No. 651,341
Int. Cl.⁴ F23N 5/24
U.S. Cl. 431—16 **7 Claims**



1. A vent flow monitor for an appliance characterized by:

a tubular member extending through an opening in a wall of a vent in proximity to said appliance;

said tubular member having a first turned portion and a second turned portion downstream of said first turned portion, and a first turbular portion connecting said first and second turned portions, and a second tubular portion connected to said second turned portion and extending transverse of flow through said vent, said second tubular portion having at least one opening facing upstream in said vent;

said tubular member having an outer end positioned on the exterior side of the wall of said vent;

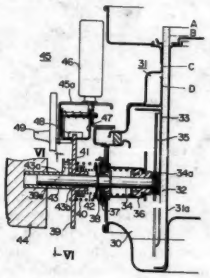
a switch means mounted in proximity to said outer end and being responsive to the presence of heated flue gases flowing out of said outer end of said tubular member; and

said switch means being operably connectable to an alarm indicator or a fuel shut off valve of said appliance.

4,613,298
OIL BURNER

Toyohei Harada, Nara, and Muneo Tao, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1985, Ser. No. 744,259
Claims priority, application Japan, Jun. 19, 1984, 59-125953
Int. Cl.⁴ F23N 5/24
U.S. Cl. 431—88 **5 Claims**



1. An oil burner comprising:

a wick shaft rotatable in opposite directions to raise a wick to a position for burning and to lower the same to a position for extinguishing a flame;

spring means for providing a bias force against said wick shaft, said bias force tending to rapidly lower said wick to the position for extinguishing a flame, said spring means having energy stored therein by rotation of said wick shaft to raise said wick;

a rotary member rotatably axially slidably mounted on said wick shaft, said rotary member being rotatable in a wick elevating and a wick lowering direction and having a plurality of engaging portions thereon;

a lock member for resiliently engaging with said engaging portions of the rotary member to lock said rotary member from rotating in the same direction as said wick shaft during a lowering of said wick;

a vibration sensor for sensing vibrations and in response thereto releasing the locking action of said lock member;

an actuation member mounted on said wick shaft and adapted to be resiliently contacted by said rotary member;

means for biassing said rotary member into resilient contact with said actuation member;

a stop member integrally provided on a surface of said rotary member, which surface contacts with said actuation member, for stopping said wick shaft at a predetermined position when it is rotating in the wick lowering direction; and,

a slide shaft fitted on said wick shaft in a manner to rotate therewith and to be axially slidable thereon;

wherein when said slide shaft is pushed toward said rotary member and against the bias of said biassing means, said rotary member is axially moved to cause disengagement of said actuation member and said stop member, thus allowing said wick shaft to rotate in the direction of extinguishing a flame.

4,613,299

DEVICE FOR COMBUSTION OF A FUEL AND OXYGEN MIXED WITH A PART OF THE COMBUSTION GASES FORMED DURING THE COMBUSTION

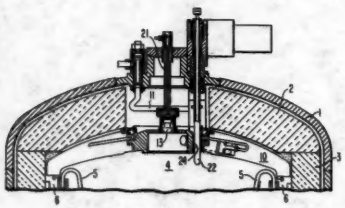
Tommy Backheim, Pepparrotsvägen 21, S-230 30 Oxie, Sweden

Filed May 29, 1985, Ser. No. 739,047

Claims priority, application Sweden, Jun. 5, 1984, 8403010

Int. Cl.[4] F23D *11/44*

U.S. Cl. 431—116 **7 Claims**



1. A device for combustion of fuel admitted from a fuel supply and oxygen admitted from an oxygen supply and mixed with a part of the combustion gases formed during the combustion, said device comprising a shroud, walls defining a generally rotation-symmetrical plenum chamber within said shroud in which the combustion is completed, said walls comprising heater tubes leaving gaps between them through which the combustion gases may leave the plenum chamber, an annular chamber surrounding the plenum chamber for receiving the combustion gases, and device also comprising a fuel nozzle communicating with the fuel supply, and a plurality of ejectors surrounding, and directed toward, said fuel nozzle and using pure oxygen as driving gas for sucking in, and mixing with, a part of the combustion gas which has passed said gaps between the heater tubes, said device further comprising an oxygen supply tube communicating with said oxygen supply and attached to said shroud and extending into said chamber; a hub supported by said oxygen supply tube and having an annular oxygen supply channel in flow communication with said oxygen supply tube; a plurality of ejector support tubes, said support tubes being bent approximately 180 degrees and connected to said hub and communicating with said annular oxygen supply channel therein, said tubes also being connected to support respective ejectors at ejector ends distant said fuel nozzle, said hub being carried by said oxygen supply tube; and two disc shaped covers mounted on said hub and leaving a space between them in which said ejectors are located, the outer peripheries of said discs terminating adjacent to, and communicating with, said annular combustion gas receiving chamber downsteam of said heater tubes relative to the combustion gas flow direction, said space between said discs forming the combustion gas flow path to said ejectors.

4,613,300

BURNER SAFETY SYSTEM

Kenneth N. Simpson, 9444 SW. Tigard St., Tigard, Oreg. 97223

Filed Oct. 9, 1984, Ser. No. 659,084

Int. Cl.[4] F23D *11/36*

U.S. Cl. 431—153 **5 Claims**

1. In combination with a fuel burner, a pilot light burner disposed adjacent the fuel burner for lighting the fuel burner, and a solenoid-operated valve controlling the supply of fuel to said fuel burner,

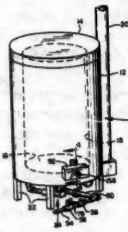
a thermocouple operable when heated to produce a thermoelectric current placed to be heated by the heat of the pilot light burner,

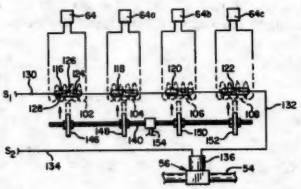
an electromagnetic coil connected across said thermocouple energized by the thermoelectric current of the thermocouple,

a reed switch unit including an envelope and switch contacts within said envelope actuated by the application of a magnetic flux thereto, said reed switch being mounted adjacent and in the magnetic field of said coil with energizing of the coil,

a magnet,

a mounting for said magnet wherein such is spaced from said reed switch unit, said mounting including selectively





actuated means operable when actuated to move said magnet into a position of closer proximity to said reed switch unit whereby the switch contacts of the unit are actuated by the magnetic field of the magnet,

and circuit means connected to the reed switch unit and actuated by the unit to control actuation of the solenoid of said solenoid-operated valve.

4,613,301

IGNITION DEVICE

Tatuo Miyoshi, Ota; Jyoji Uno, Isesaki, and Kouji Iwamatsu, Ojima, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1985, Ser. No. 690,527

Claims priority, application Japan, Jan. 17, 1984, 59-5970; Jan. 17, 1984, 59-5961

Int. Cl.[4] F23Q *7/22*

U.S. Cl. 431—259 **8 Claims**

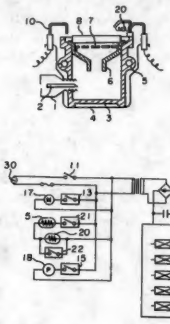
1. An ignition device comprising:

a preheater for preheating a carburetor wall;

an ignition heater for igniting an air-fuel mixture produced inside said carburetor wall such that (a) said ignition heater is arranged to be connected in series to said preheater, (b) said preheater has a first switching means for controlling current conduction to said preheater wherein said first switching means is provided between said preheater and a power source for said preheater:

a third switching means which becomes conductive during a preheating operation and a fourth switching means which is connected in parallel to said third switching means and becomes conductive during an ignition operation, (c) a second switching means connected in parallel to said ignition heater to perform switching control in such a manner that said ignition heater becomes inactive by the breaking of the serial connection to said preheater during said preheating operation and said ignition heater becomes active by connection in series to said preheater during the ignition operation, and

a by-pass circuit which is connected with respect to said ignition heater in said preheating operation and said ignition heater is connected in series to said preheater without formation of said by-pass circuit during the ignition operation.

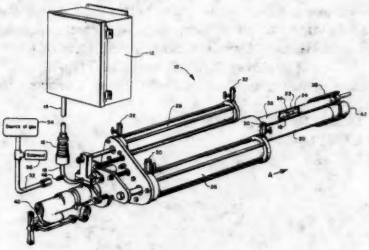


4,613,302

METHOD AND APPARATUS FOR PROTECTING BOILER IGNITORS

Derald Oliver, Castle Dale, Utah, assignor to Utah Power & Light

Filed Dec. 31, 1984, Ser. No. 687,642
Int. Cl.[4] F23Q *3/00*
U.S. Cl. 431—263 **19 Claims**



1. A method for protecting the retracted ignitor probe of a furnace lighter from damage during operation of the furnace, comprising the steps of:

providing a furnace lighter with an ignitor sleeve and an ignitor probe; said ignitor probe being retracted into the ignitor sleeve and being connected to an ignitor support tube at a coupling;

installing a connector, capable of receiving a gas, on the ignitor support tube remote from the coupling between the ignitor support tube and the ignitor probe;

providing an outlet for said gas through the ignitor support tube near the coupling between the ignitor support tube and the ignitor probe; and

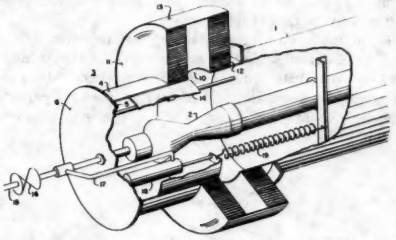
injecting a cool gas into the connector capable of receiving a gas such that the gas passes into the ignitor sleeve and over the ignitor probe, thereby cooling the ignitor probe and deterring deposits of waste material on the ignitor probe.

4,613,303

COMBUSTION AIR CONTROL IN AN IN-LINE FLAME ARRESTOR

William R. Willis; James D. Hunter, both of Tulsa, and Max L. Lewis, Okmulgee, all of Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 506,961, Jun. 23, 1983, abandoned. This application Aug. 10, 1984, Ser. No. 639,612
Int. Cl.[4] F23D *14/82*
U.S. Cl. 431—346 **5 Claims**



1. A flame arrestor and combustion air control combination, including,

an elongated cylindrical firetube into which combustion is to be propagated,

a hollow cylindrical core sealed by a first end to the entrance of the firetube,

a removable base plate mounted on and sealing the second end of the core,

a burner mounted on the base plate and within the core as a housing to propagate combustion into the firetube,

an aperture through the wall of the cylindrical core through which combustion air flows to the burner,

two spools of flame arrester screen mounted on the core, one on each side of the aperture,

a sheath mounted about the two screen spools and sealed to the spool peripheries to limit combustion air flow to paths through both screens and down through the common aperture between the screens and into the cylindrical core,

a sleeve positioned within the cylindrical core to establish the effective size of the aperture in the path of the combustion air,

a linkage between the sleeve and the base plate powered by fluid pressure to increase the size of the aperture by movement of the sleeve,

a spring connected between the sleeve and the core to generate a force urging the sleeve in a direction to reduce the size of the aperture, and

a connection between the sleeve and the pressure of the fuel supplied the burner as power to actuate the linkage,

whereby the quantity of fluid fuel supplied the burner has its pressure applied to position the sleeve in adjustment of the quantity of air supplied the burner through the aperture to propagate the combustion by the burner.

4,613,304

GAS ELECTRICAL HYDROGEN GENERATOR

Stanley A. Meyer, 3792 Broadway, Grove City, Ohio 43123

Continuation-in-part of Ser. No. 435,889, Oct. 21, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,577
Int. Cl.[4] F23D *14/62*
U.S. Cl. 431—354 **12 Claims**

1. In combination, a hydrogen/oxygen generator comprising:

a hydrogen/oxygen generator including a housing having a gas collection chamber for maintaining a preset volume of gas therein under pressure,

an outlet attached to said collection chamber,

a non-magnetic tubing connected to said outlet,

a gas line tubing connected to the other end of said non-magnetic tubing and said collection chamber in a closed loop, utilization means, and

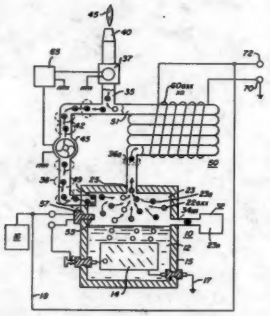
a Y type of connector alternately connecting said gas line tubing to said gas utilization means and said collection chamber;

an inlet means attached to said gas collection chamber,

a source of permanently magnetized polarized particles connected to said inlet and wherein said particles upon entering said inlet to said chamber become superimposed on said hydrogen/oxygen gases,

means in said non-magnetic tubing for maintaining said polarized particles circulating through said closed loop,

a pick-up coil positioned over said non-magnetic tubing and wherein the magnetic field of said magnetized particles passing through said tubing and traversing said pick-up coil induces a voltage/current therein,



means for varying the acceleration of said polarized particles in said closed-loop tubing to vary the output magnitude of said induced voltage in said coils,

means connected to said coil for utilization of said induced voltage/current potential; and

wherein said hydrogen/oxygen gasses are pressure released to said utilization means, and the attractive force of said particles causes a continuous movement through said closed loop non-magnetic tubing.

3. The combination as set forth in claim 1 further comprising:

a nozzle connected to said gas utilization means of a predetermined size and configuration having a port for expelling said mixed gasses, and

means for igniting said gasses.

4,613,305

HORIZONTAL FURNACE WITH A SUSPENSION CANTILEVER LOADING SYSTEM

Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 9, 1985, Ser. No. 732,304

Claims priority, application Japan, May 15, 1984, 59-96983

Int. Cl.[4] F27D *5/00*

U.S. Cl. 432—253 **6 Claims**

1. A furnace for heat treating workpieces comprising:

a main heating chamber in which said workpieces are treated;

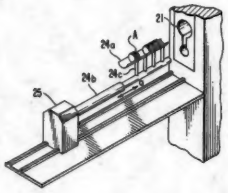
a longitudinal supporting chamber connected in parallel to said main heating chamber;

a connecting chamber connecting said supporting chamber to said main heating chamber;

heating means provided around said main heating chamber for heating substantially only said main heating chamber, whereby during a heating process the temperature in said supporting chamber is lower than the temperature in said heating chamber;

suspension cantilever means movable in said supporting chamber along the axis of said supporting chamber;

accommodating means positioned in said main heating chamber for holding workpieces to be heat treated; and



connecting means between said accommodating means and said cantilever means, said connecting means being movable in said connecting chamber along the axis of said main heating chamber.

4,613,306

EVAPORATOR CRUCIBLE FOR VACUUM DEPOSITING SYSTEMS

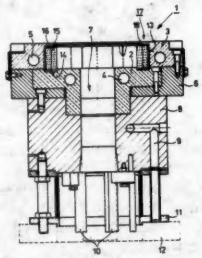
Volker Bauer; Albert Feuerstein, both of Neuberg, and Horst Ranke, Alzenau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed May 2, 1985, Ser. No. 729,675

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420246

Int. Cl.[4] F27B *14/10;* C23C *16/00;* H01J *37/305;* H05B *6/16*

U.S. Cl. 432—264 **6 Claims**



1. An electron-beam evaporator crucible for vacuum depositing systems, comprising:

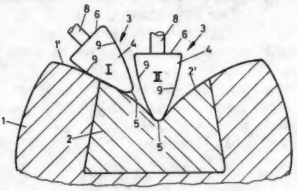
a crucible bottom with a wall surface forming a plurality of bottom openings for the introduction of evaporation material in rod form, and a metal crucible rim having a wall surface disposed at a distance from the bottom openings, and a coolant passage in said crucible rim; and

a lagging comprising ceramic material provided internally on at least a portion of the depth of said crucible rim.

4,613,307
DENTAL TOOL

Stefan Neumeyer, Leminger Strasse 10, 8491 Eschikam, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,692
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335797; Oct. 21, 1983, 3338256; Dec. 29, 1983, 3347428
Int. Cl.⁴ A61C *3/06*
U.S. Cl. 433—166 **5 Claims**



1. A dental finisher tool, comprising a conical body having a base at one end and a rounded tip at its opposite end and having an outer surface in the form of a surface of rotation that is symmetrical with respect to the axis extending from said base to said rounded tip, said rounded tip and said outer surface providing the working surface of said tool, said conical body being rotatable about said axis of symmetry; a stem extending from said base and coaxial with said axis of symmetry; a plurality of cutting means on said outer surface of said conical body for finishing a tooth filling; the radius of curvature of said rounded tip being about 0.2 millimeters and said outer surface being convexly curved along the entire distance from said base to said rounded tip such that with said base having a diameter in the range of 1.5 to 1.7 millimeters and with the distance between said tip and said base being about 3.5 millimeters, the diameter of said conical body is a function of its distance from the base as follows:

Distance From Base (millimeters)	Diameter (millimeters)
1 [unit]	1.3 to 1.45 [units]
2 [units]	1.0 to 1.2 [units]
3 [units]	0.5 to 0.7 [units]

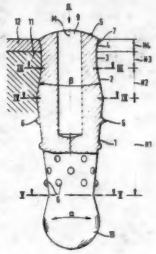
whereby the user of the tool can work on multiple tooth surfaces, including fissures, with a single tool.

4,613,308
JAW IMPLANT HAVING AN APERTURE TO RECEIVE A REPLACEMENT-TOOTH HOLDER

Peter A. Ehrl, Freudenstadt, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,695
Int. Cl.⁴ A61C *8/00*
U.S. Cl. 433—173 **7 Claims**

1. A jaw implant comprising:
an apical end comprising a spherical segment exceeding the size of a hemisphere;
a first truncoconical portion following upon said apical end, the cross-sectional area of said first truncoconical portion increasing in the coronal direction;
a second truncoconical portion following without transition upon said first portion and having a height of of 3 to 6 mm, the cross-sectional area of said second truncoconical portion decreasing in the coronal direction;
a third approximately cylindrically shaped portion adjoining said second portion and having a height of 1 to 3 mm and provided for embedding in the cortical bone tissue; and
a fourth truncoconical portion following said third portion and having a height of 1 to 2 mm and having a cross-sectional area increasing in the coronal direction;
the height of said first portion being greater than the height of said second portion;

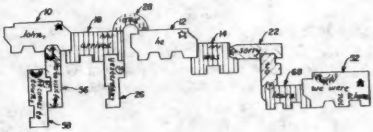


at least said fourth portion having an opening provided for the accommodation of a tooth holder;
said first, second, third and fourth portions having approximately elliptical cross sections.

4,613,309
FIGURES OF SPEECH

Emily A. McCloskey, P.O. Box 187, 103 Wayne St., Claysville, Pa. 15323

Filed Sep. 19, 1985, Ser. No. 777,730
Int. Cl.⁴ G09B *1/34*
U.S. Cl. 434—170 **6 Claims**

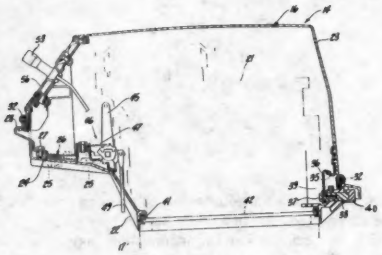


1. An educational model for teaching language grammar, parts of speech, syntax, and sentence structure comprising a plurality of sets of independent elements, wherein:
a. each set of independent elements is identified and distinguished from other sets by a designated color scheme common to each element of a set;
b. each independent element within a set represents a word or group of words;
c. each independent element within a set is adapted to be interengaged proximately with at least one other element in order to construct at least one of a phrase, clause, and sentence;
d. each independent element within a set is distinguishable by the presence of a symbol thereon which indicates said element's function as a part of speech;
e. each independent element within a set has a designated shape which indicates said element's relationship to other parts of speech; and
f. each independent element within a set can be proximately interengaged with other elements to show the case and part of sentence of each element within a sentence.

4,613,310
OUTBOARD MOTOR

Tomonori Suzuki, Hamamatsu, and Makoto Toyohara, Shizuoka, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 405,916, Aug. 6, 1982, abandoned. This application Oct. 22, 1984, Ser. No. 663,334
Claims priority, application Japan, Aug. 25, 1981, 56-132996
Int. Cl.[4] B63H *21/00*
U.S. Cl. 440—76 6 Claims

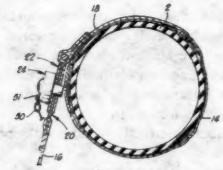


1. A power head arrangement for an outboard motor comprising an internal combustion engine and surrounding protective cowling adapted to be affixed to the upper portion of said drive shaft housing, said protective cowling comprising a tray portion adapted to underly the engine, a main cowling portion detachably affixed to said tray and adapted to substantially enclose the engine, said main cowling portion defining a forwardly facing opening disposed above said tray and in proximity to the engine, a front cover portion pivotally supported by said tray and movable between a closed position for closing said main cowling portion forwardly facing opening and an open position extending forwardly of said opening and affording access through said opening, and engine controlling means carried by said front cover portion and movable with said front cover portion during its pivotal movement.

4,613,311
AUTOMATICALLY DISCONNECTING SAFETY CONNECTOR FOR AQUATIC APPARATUS

John A. V. Wood, 306 N. Meridian, Waurika, Okla. 73573

Filed Feb. 6, 1985, Ser. No. 698,560
Int. Cl.[4] B63B *35/76*
U.S. Cl. 441—130 15 Claims



1. A connector apparatus for a floatable device, which connector apparatus automatically disconnects when the floatable device is overturned, said connector apparatus comprising:

a first coupling member having a first aperture defined therethrough, said first coupling member including means for receiving a first part of the floatable device;

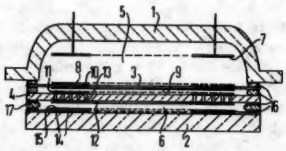
a second coupling member having a second aperture defined therein, said second coupling member including means for receiving a second part of the floatable device; and

weighted pin means for being inserted into said first and second apertures to releasably secure said first coupling member to said second coupling member when said first and second coupling members are disposed adjacent each other and said first and second apertures are aligned and for being moved out of said first and second apertures in response to gravity to release said first and second coupling members when the floatable device is overturned.

4,613,312
GAS DISCHARGE DISPLAY DEVICE AND METHOD FOR ITS PRODUCTION

Peter Mammach, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 638,323
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343951
Int. Cl.[4] H01J *9/38*
U.S. Cl. 445—25 6 Claims



1. A method for producing a gas discharge display panel including a gas-filled envelope containing at least two mutually parallel plates which are joined together and sealed by a glass solder frame, at least one of said plates having separately controllable electrodes that pass through said frame, said method comprising the steps of:

(a) stacking said plates, one over the other, with a glass solder composition arranged between them, to form a cell;

(b) heating said cell to a first temperature, which is the soldering temperature T_1 of said glass solder composition;

(c) cooling said cell to a lower second temperature T_a, the temperature difference $T_1 - T_a$ being less than 100° C.;

(d) evacuating the interior of said cell;

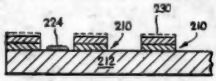
(e) baking said cell with its interior evacuated at said temperature T_a; and

(f) cooling said cell to room temperature T_r.

4,613,313
IONIZATION DETECTOR

Douglas S. Steele, Saratoga Springs, N.Y., assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 27, 1983, Ser. No. 565,670
Int. Cl.[4] G01N *23/00*
U.S. Cl. 445—28 4 Claims



1. In an ionization detector comprising a plurality of parallel, elongated detector elements comprising nickel as a major constituent in each, a method of reducing the tendency of the elements to behave as high impedance current sources following exposure to an ion shower, the method comprising the following steps:

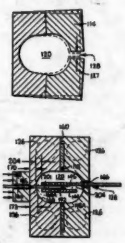
(a) interposing a film of gold between each element and a sheet of stainless steel;

(b) attaching the detector elements to a substrate;

(c) removing the stainless steel sheet from the gold;

(d) removing the gold from the detector elements; and
(e) examining the spaces between the detector elements for metallic debris and, if the cross-sectional area of the debris exceeds 0.5% of the area of the spaces, reducing the amount of debris to below 0.5% by scrubbing the array with a water-based slurry of aluminum oxide particles.

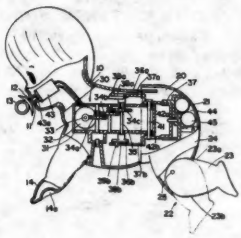
4,613,314
IONIZATION DETECTOR
Douglas S. Steele, Saratoga Springs, N.Y., assignor to General Electric Company, Cincinnati, Ohio
Filed Dec. 27, 1983, Ser. No. 565,672
Int. Cl.[4] H01J *9/38*
U.S. Cl. 445—28 **2 Claims**



1. A method of manufacturing an ionization detector, comprising the following steps:
(a) depositing a plurality of substantially parallel, spaced, elongated conductive elements upon a substrate;
(b) scrubbing the detector array of (a) with an abrasive slurry to remove debris present between the elements, thereby reducing the concentration of debris to below a predetermined amount;
(c) ultrasonically cleaning the elements and the substrate, thereby reducing the amounts of organic materials in contact therewith;
(d) extending the substrate through a slot contained in an elongated end plate, the end plate having an elongated first concavity extending along the slot;
(e) expanding the slot of (d);
(f) inserting a sealant which solidifes with time between the substrate and the slot;
(g) after the sealant has reached a predetermined degree of solidification, allowing the slot to compress the sealant;
(h) fastening the end plate to an elongated housing having an elongated second concavity, the first and second elongated concavities mating to form a chamber; and
(i) filling the chamber with xenon gas to a pressure exceeding 500 pounds per square inch, thereby placing a shear load upon the compressed sealant of (g).

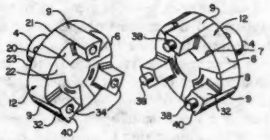
4,613,315
DOLL TOY
Isamu Katsoka, Narashino, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1985, Ser. No. 703,349
Claims priority, application Japan, Nov. 9, 1984, 59-236259
Int. Cl.[4] A63H *3/22*
U.S. Cl. 446—355 **5 Claims**

1. A mechanical doll toy having the capability of crawling and walking, at the option of the player, comprising:
a body member having an upper and lower portion;
a support casing member fixed inside of the upper portion, and having two apertures, one of which is disposed in one side of the support casing member and the other being elongated and in a side opposite the one side;
a first pin inside the support casing member and extending through the apertures therein;
a gear assembly mounted inside the support casing member;
motor means for driving the gear assembly;
a shaft connected to the gear assembly;
a pair of cranks, one being connected to each end of the shaft;
a pair of second pins, one being connected to each crank;
a connection member having a pair of arm plates and being fixed inside the lower portion, the length of each arm plate being of such a dimension to enter the inside of the upper portion and to be positioned on the one side and the opposite side thereto of the support casing member, and each



arm plate having an elongated aperture at its tip end to engage the pair of second pins, the connecting member pivotally connected to the support casing member by the first pin;
a pair of legs connected to the lower portion, each having an upper and lower leg, each leg being articulated to permit the lower leg to pivot relative to the upper leg to simulate the composite action of the lower portion which comprises horizontal and vertical rotation depending on the position of the lower leg; and
switch means for activating the motor means.

4,613,316
MOLDED CONSTANT VELOCITY COUPLING
David F. Reynolds, Wrentham, Mass., assignor to Barry Wright Corporation, Newton, Mass.
Filed Oct. 29, 1984, Ser. No. 665,601
Int. Cl.[4] F16D *3/64*
U.S. Cl. 464—85 **24 Claims**



1. A substantially constant velocity coupling comprising:
first and second mutually confronting mating members;
each of said mating members comprising:
(1) a hub (4) adapted to be coaxially affixed to a shaft for rotation therewith, and a plurality of mutually-spaced spokes (6) formed integral with and projecting radially from said hub;
(2) a plurality of torque transmitting elements (9) located between said spokes; and
(3) a plurality of elastomeric connecting elements (12) located between said spokes and said torque transmitting elements in surrounding relation to said hub;
said elastomeric connecting elements being bonded to said spokes, said torque transmitting elements and said hub so as to form a unitary assembly;

said first and second mating members being arranged so that the said torque transmitting elements of said first mating member are aligned with the said torque transmitting elements of said second mating member; and

said first mating member having cavities (34) in its said torque transmitting elements and said second mating member having posts (38) affixed to ends of its said torque transmitting elements which are received by said cavities, whereby said first and second mating members are coupled to one another.

4,613,317
CARDAN UNIVERSAL JOINTS

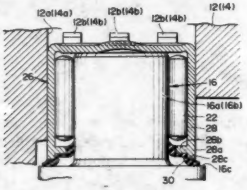
Shinji Morihiro, Komae, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1984, Ser. No. 666,737

Claims priority, application Japan, Nov. 7, 1983, 58-172043[U]

Int. Cl.[4] F16C *33/76*; F16D *3/26*

U.S. Cl. 464—131 1 Claim



1. A Cardan universal joint comprising:

an input yoke formed at its bifurcate portions with a pair of radial opening axially aligned with each other;

an output yoke formed at its bifurcate portions with a pair of radial openings axially aligned with each other;

a cross spider having two pairs of arms respectively aligned to have common axes which are normal to each other, each of said cross arms being formed at its inward end with an annular shoulder;

four needle bearing assemblies respectively mounted in said openings and supporting therein said cross arms so that said input and output yokes are joined by said cross spider by interposing therebetween said needle bearing assemblies, each of said needle bearing assemblies having a cap covering a corresponding one of said cross arms and a plurality of needle rollers confined between said cap and said one of the cross arms, said cap having, with respect to the axis of said one of the cross arms, an inward open end formed with a radially inward flange facing said shoulder and said needle rollers and having an outer face and an inner circumferential surface surrounding the outer circumferential surface of the corresponding cross arm and providing an annular opening narrower than the diameter of said needle rollers, said open end of said cap being formed with an annular ring of an L-shaped cross section having said radially inward flange and an axial extension;

an annular sealing member interposed between said outer face of said flange of said cap and said shoulder having an annular section extending between said inner circumferential surface of said flange and said outer circumferential surface of said cross arm and filling said annular opening to provide a seal therebetween; and

means directly bonding said annular sealing member to said outer face of said flange of said cap, said annular sealing member being composed of a single uniform sealing material,

said radially inward flange having an inner circumferential surface surrounding the circumferential periphery of said one of the cross arms, said sealing member having an L-like cross section and being arranged to lie over to be bonded to said inner circumferential surface of said radially inward flange and said axial extension so that it contacts not only said shoulder but also the circumferential periphery of said one of the cross arms, said sealing member having one leg of said L-like cross section extending through said annular opening and a second leg extending radially and contacting said shoulder along one side of said second leg and extending between said axial extension and said shoulder.

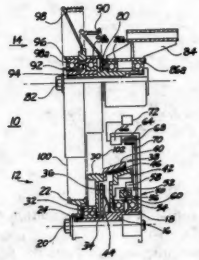
4,613,318
DRIVE SYSTEM WITH WEAR COMPENSATOR

Richard D. McWilliam, West Lorne; Andrew G. Anderson, London; Donald A. McCharles, Blenheim; Donald J. McLaren, Oakville, and Kwang Yew, Chatham, all of Canada, assignors to Canadian Fram Limited, Chatham, Canada

Filed Aug. 30, 1985, Ser. No. 771,338

Int. Cl.[4] F16H *9/00*

U.S. Cl. 474—74 13 Claims



1. A drive system comprising:

an input member;

an output member;

friction clutch means movable in a first direction to cause engagement and in an opposite or second direction to cause disengagement of said input and said output members;

means isolated from said input member, responsive to control signals for moving said clutch means in said first and said second directions; and

control means for generating a first control signal to cause said clutch means to move in said first direction thereby engaging said output member to said input member and including wear compensation means for generating a second control signal to cause said clutch means to move in said second direction by a fixed amount thereby disengaging from said output member.

4,613,319
SPEED CHANGE DEVICE FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 6, 1984, Ser. No. 637,729

Claims priority, application Japan, Aug. 8, 1983, 58-123660[U]

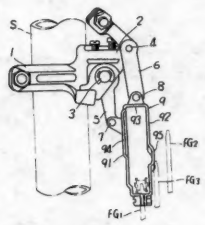
Int. Cl.[4] F16H *7/18*; B60K *20/00*; G05G *5/06*

U.S. Cl. 474—80 1 Claim

1. A speed change device for a bicycle, comprising a front derailleur having a speed change lever for switching a driving chain from one to another of a plurality of multistage front chain gears comprising at least one low speed front chain gear and at least one high speed front chain gear,

said front derailleur including a chain guide which is supported movably in reciprocation axially of said front chain gears, said chain guide having an inner plate and an outer plate, said inner plate including an inwardly enlarged portion enlarged toward said low speed front chain gear

and away from said high speed front chain gear, said inwardly enlarged portion being located at an upper portion of the inner plate within a range of movement of said chain in which said chain engages with said high speed front chain gear, said outer plate having an outwardly



enlarged portion enlarged toward said high speed front chain gear and away from said low speed front chain gear, said outwardly enlarged portion being located at a lower portion of the outer plate within a range of movement of said chain in which said chain engages with said low speed front chain gear.

4,613,320

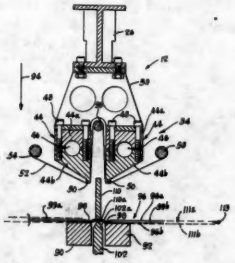
CONTAINER FORMING APPARATUS

Bernard Lerner, Peninsula, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 543,526, Oct. 20, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 763,065

Int. Cl.[4] B31B *1/64, 49/04*

U.S. Cl. 493—198 **3 Claims**



1. An apparatus for forming a chain of interconnected containers from a longitudinal, flexible web of material having two overlying plies, comprising:

(a) sealing means for forming two adjacent spaced apart heat seals on said web at spaced intervals, said seals extending transversely with respect to the longitudinal extent of said web and defining trailing and leading edges of adjacent containers;

(b) said heat sealing means including structure for making concurrent heat seal contact across the entire transverse extent of said web;

(c) seal drive means for driving said sealing means into heat sealing contact with said web;

(d) a perforating mechanism for forming a perforation between said adjacent heat seals while said web is located at said sealing means, said mechanism comprising:

(i) a rotatable perforating wheel having an axis of rotation oriented substantially transverse to the transverse extent of said web;

(ii) a carriage rotatably mounting said perforating wheel;

(iii) guide means located immediately adjacent said structure for making concurrent heat seal contact, said guide means supporting said carriage for movement substantially parallel to the transverse extent of said web and having limits of motion such that said perforating wheel can be moved to a position out of contact with said web and said heat sealing means;

(iv) drive means for driving said carriage between said limits of motion;

(v) spring biasing means urging said perforating wheel into frictional contact with a backup bar fixedly secured with respect to said sealing means, said frictional contact between said perforating wheel and said backup bar causing said wheel to rotate as said carriage moves between said limits of motion such that said perforating wheel produces a line of perforations of said web intermediate said adjacent heat seals.

4,613,321

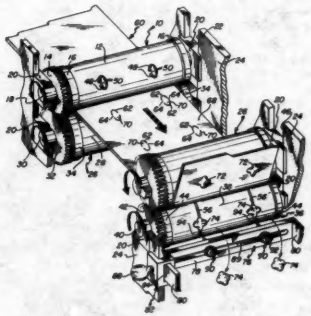
DIECUTTING ROLL SYSTEM WITH IMPROVED SCRAP DISPOSAL CAPABILITY

Martin Kesten, West Hartford; Leroy H. Carlson, Jr., Portland, and Gary L. Kwader, Windsor, all of Conn., assignors to Preston Engravers, Inc., Windsor, Conn.

Filed Sep. 6, 1985, Ser. No. 773,015

Int. Cl.[4] B31B *1/24*

U.S. Cl. 493—342 **10 Claims**



1. A system for cutting openings in a traveling web, and for facilitating the disposal of scrap pieces severed therefrom, comprising, in combination: first and second diecutting rolls adapted for journaling in a diecutting press; and a scraper member adapted for mounting thereon, each of said rolls having at least one raised cutting element on the outer surface thereof, with said cutting elements of said two rolls being configured for coaction to provide a functionally continuous edge configuration for cutting a scrap piece from the web by acting sequentially thereupon when said rolls are operated in tandem and in proper registry with one another, said cutting element of said second roll defining a circumscribed space within which the cut scrap piece will tend to lodge, and being discontinuous at least at two opposing points aligned circumferentially on said roll, said cutting element of said first roll being configured to precut the web at locations corresponding to said points of discontinuity of said second roll cutting element, and being discontinuous at least at one point which is displaced, with respect to said functionally continuous edge configuration, from said points of discontinuity of said second roll cutting element to leave a connecting web element for subsequent cutting by said cutting element of said second roll, said scraper member having an end portion which is constructed to follow said surface of said second roll and to pass through said points of discontinuity and said circumscribed space of said cutting element thereof, whereby said rolls can be mounted in tandem on a press and caused to operate sequentially upon a web traveling therethrough, to cooperatively cut

a scrap piece therefrom and to thereby produce an opening therein, and whereby said scraper member can be mounted adjacent said second roll with said end portion disposed against said surface and in alignment with said discontinuities of said cutting element thereof, to pass through said circumscribed space during rotation of said roll and to thereby dislodge any scrap piece held therewithin.

4,613,322

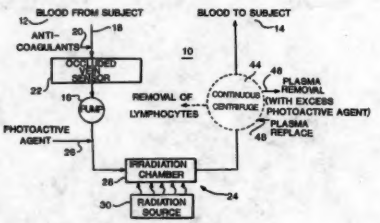
METHOD AND SYSTEM FOR EXTERNALLY TREATING THE BLOOD

Richard L. Edelson, 3 Rall Ct., Roseland, N.J. 07068

Continuation-in-part of Ser. No. 447,891, Dec. 8, 1982, and a continuation-in-part of Ser. No. 327,965, Dec. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 102,553, Dec. 11, 1979, Pat. No. 4,321,919, said Ser. No. 447,891, is a continuation-in-part of Ser. No. 274,319, Jun. 16, 1981, Pat. No. 4,428,744, and a continuation-in-part of Ser. No. 272,981, Jun. 12, 1981, Pat. No. 4,398,906, each is a continuation-in-part of Ser. No. 102,553, Dec. 11, 1979, Pat. No. 4,321,919. This application Mar. 29, 1983, Ser. No. 480,096

Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—6 **10 Claims**



1. A method for reducing the functioning population of a blood constituent in the blood supply of a human subject, comprising the steps of:

withdrawing blood from said subject,

treating said withdrawn blood to subject it to a density gradient so as to effect a substantial separation of the red blood cells from the blood constituent sought to be reduced in population, and

irradiating said treated blood with UV radiation oriented so that said radiation preferentially impinges upon said constituent in the presence of an effective amount of a dissolved photoactive chemical agent specific for a receptor site in or on the blood constituent and capable when activated by said UV radiation of forming photo-adducts with blood constituent receptor sites, to thereby effect chemical bonding between said photoactivated chemical agent and said receptor sites, thereby initiating the destruction, inactivation and/or removal of said blood constituent from the blood supply of the subject and returning the irradiated blood to said subject.

4,613,323

MULTIPLE FUNCTION INTUBATION APPARATUS AND METHOD

Jane A. Norton; Diana L. Twyman; A. Byron Young, and Robert Rapp, all of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Nov. 19, 1984, Ser. No. 672,414

Int. Cl.[4] A61M *25/00*

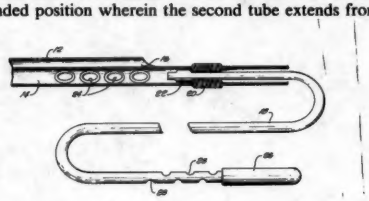
U.S. Cl. 604—43 **10 Claims**

1. An intubation apparatus for providing lavage, sump and enteral feeding functions and the like for a patient, comprising:

a first tube including at least one passageway and having a first end for introduction into the patient;

port means in the passageway adjacent the first end of the first tube; and

a second tube having a proximal and a distal end, said second tube being received within the passageway of said first tube and movable between an intubation position wherein said second tube is contained within said first tube and an extended position wherein the second tube extends from



the first tube so as to open the port means within the passageway for sump operation;

said first tube including a constriction means between said port means and said first end and said second tube including means adjacent the proximal end for engaging said constriction means so as to retain the proximal end of said second tube within the passageway of said first tube when said second tube is in the extended position.

4,613,324

METHOD AND APPARATUS FOR GUIDING CATHETER INTO VENTRICULAR SYSTEM OF HUMAN BRAIN

Jamshid B. G. Ghajar, 435 E. 70th St., New York, N.Y. 10021

Filed Jun. 17, 1985, Ser. No. 745,673

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—49 **13 Claims**

1. An apparatus for accurately and reproducibly inserting a catheter through an orifice drilled in a human cranium and guiding said catheter into a ventricle of a human brain, said apparatus comprising,

(a) tubular means adapted to receive and guide said catheter therethrough,

(b) support means for said tubular means, said support means being adapted to rest unsecured on said human cranium in surrounding spaced relation to said orifice,

(c) said support means and said tubular means being related to each other and to said cranium so as to guide said catheter through said orifice and in a direction perpendicular to an imaginary plane defined by a tangent to the cranium of said orifice, independent of the orientation of the orifice,

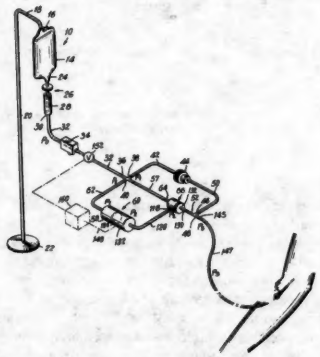
(d) said tubular means adapted to be in guiding engagement with said catheter while the free end of said catheter is inserted into said human brain.

4,613,325

FLOW RATE SENSING DEVICE

Lawrence M. Abrams, 32 Herrick Dr., Lawrence, N.Y. 11559

Continuation-in-part of Ser. No. 399,825, Jul. 19, 1982, abandoned. This application Dec. 22, 1983, Ser. No. 564,332
Int. Cl.[4] A61M *5/14;* G01F *1/38*
U.S. Cl. 604—65 21 Claims



1. A flow rate sensing device comprising:

(a) a housing having a fluid inlet means for permitting ingress of a fluid and a fluid outlet means for permitting egress of the fluid;

(b) means for forming an upstream flow path portion in fluid communication with the fluid inlet means, said upstream flow path portion having a predetermined median flow-through cross-sectional area;

(c) means for forming a downstream flow-through passage in fluid communication with the upstream flow path portion and the fluid outlet means; and

(d) flow rate fluctuation detection means comprising:

(i) means [in the]within said housing for forming a flow-through throat passage comprising flow passage constricting means and means defining an opening and permitting fluid flow across said flow passage constricting means, the flow-through throat passage being intermediate the upstream flow path portion and the downstream flow-through passage and in fluid communication with both said upstream flow path portion and said downstream flow-through passage, thereby defining a direct fluid flow path from the fluid inlet means successively through the upstream flow path portion, the flow-through throat passage, the downstream flow-through passage, and the fluid outlet means, and said flow-through throat passage having a constricting means comprising a median flow-through cross-sectional area which is substantially less than said predetermined median flow-through cross-sectional area so that a decrease in pressure of the fluid flowing along the path is generated within said flow-through throat passage; and

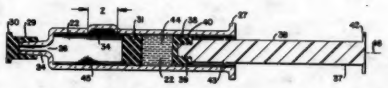
(ii) pressure transducer means in fluid and pressure communication with said flow-through throat passage and with the upstream flow path portion, respectively, said pressure transducer means being operative to sense a difference between the lateral fluid pressure of the fluid flowing into the upstream flow path portion and the lateral fluid pressure of the fluid flowing out of said flow-through throat passage and to generate a transducer signal which varies as a function of the sensed difference in pressure, the lateral fluid pressure of the fluid flowing out of said flow-through throat passage being measured immediately adjacent to said flow-through throat passage constricting means by pressure communicating means having an axial bore therethrough and providing fluid communication between the upstream flow path portion and the downstream flow-through passage, said pressure communicating means being provided with means for pressure and fluid communication with the pressure transducer means.

4,613,326

TWO-COMPONENT MEDICATION SYRINGE ASSEMBLY

Joseph M. Szwarc, Cedar Grove, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 12, 1985, Ser. No. 754,801
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—89 28 Claims



1. An operable two-component medication syringe assembly comprising:

an elongate barrel having an interior wall defining a chamber for retaining medication;

a distal end of said barrel having a passageway therethrough communicating with said chamber;

a bypass stopper slidably positioned in fluid-tight engagement inside said barrel;

a raised elongate peripheral portion of said barrel serving as a bypass and defining a bypass zone, said bypass zone being longer along the longitudinal axis of said barrel than the length of said bypass stopper along the longitudinal axis of said barrel, said bypass being raised enough to allow fluid flow around said bypass stopper when said bypass stopper is positioned within said bypass zone;

a bypass stopper extension projecting outwardly from the distal end of said bypass stopper, said extension including a distal extension rib contacting said interior wall of said barrel and a recess between said extension rib and said bypass stopper, said extension rib including a groove for allowing fluid communication between said recess and said chamber, said groove being positioned angularly with respect to the longitudinal axis of said barrel so the fluid passing through said groove is directed angularly with respect to the longitudinal axis of said barrel;

a stopper slidably positioned in fluid-tight engagement inside said barrel, said stopper being positioned further from said distal end than said bypass stopper, said stopper capable of moving fluid from said chamber through said passageway upon its movement toward said distal end, said stopper capable of facilitating the drawing of fluid into said chamber through said passageway upon its movement away from said distal end;

a rigid plunger rod having an elongate body portion engaging said stopper to facilitate operation of said stopper, said body portion extending outwardly from the proximal end of said barrel; and

a plunger rod barrier flange positioned transversely with respect to the longitudinal axis of said body portion and intermediate the ends thereof, said barrier flange projecting outwardly from said body portion into the space between the inside of said barrel and the outside of said body portion wherein the area described by the periphery of said barrier flange as viewed along the longitudinal axis of said plunger rod being at least about 87 percent as large as the area described by the interior wall of said barrel as viewed along the longitudinal axis of said barrel, said barrier flange acting as a barrier for blocking the path of fluid which may be propelled in a distal direction through said bypass while said syringe is being operated, said barrier flange being positioned on said body portion so

that said barrier flange is within said chamber when said stopper is positioned in said bypass zone.

4,613,327

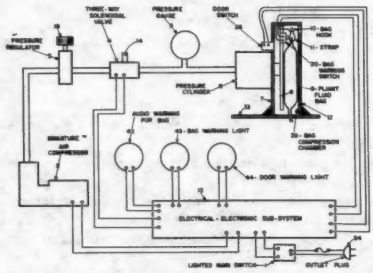
APPARATUS FOR INFUSING BLOOD AND OTHER RELATED FLUIDS INTO A PATIENT'S BODY

Haig V. Tegrarian, 17 Kitchner Ct., and Mikael Ciftan, 2606 Tryon Rd., both of Durham, N.C. 27705

Continuation-in-part of Ser. No. 574,199, Jan. 26, 1984, abandoned, which is a continuation of Ser. No. 240,897, Mar. 3, 1981, abandoned. This application Sep. 10, 1985, Ser. No. 774,381

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—141 **13 Claims**



1. Portable apparatus for infusing a fluid from a pliant fluid container having an exit port, through a tubular member into a human body at rates of normal to massive infusion, including

(a) a boxlike member having fixed top, bottom, side and end walls

(b) a rigid movable pressure plate within said boxlike member extending between the side walls thereof, and normally lying in spaced relation to the end walls, thereby forming a compression chamber between said movable wall and one of said fluid end walls

(c) a support member carried by said movable plate on the compression chamber side thereof, for holding the pliant fluid container in engagement with said pressure plate

(d) a door in one of the sides of said boxlike member providing access to the compression chamber, for inserting a filled, pliant fluid container into the compression chamber, and removing empty pliant fluid containers therefrom

(e) a piston and cylinder mounted in said boxlike member, one end of said piston being engaged with said pressure plate for moving the latter through the compression chamber and squeezing the pliant fluid container between the pressure plate and said one end wall to discharge the fluid in the fluid container through the exit port thereof

(f) air pressure means operatively engaged with said piston and cylinder for actuating the former to maintain a constant pressure on the fluid container to discharge the entire contents thereof

(g) a pressure regulator connected to said air pressure means to selectively vary the range of discharge of fluid from the pliant fluid container.

(h) power means in circuit with said air compressor for activating the latter

(i) switch means in circuit with said air compressor for halting the movement of said pressure plate after the pliant fluid bag has be emptied, and

(j) spring means for retracting said piston and pressure plate upon actuation of said switch means

(k) said pressure plate engaging an end wall of said boxlike member after it has been retracted to its initial position.

4,613,328

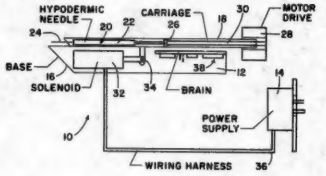
BIO-MEDICAL INJECTOR APPARATUS

Cecil Boyd, P.O. Box 428, Neosho, Mo. 64850

Filed Oct. 22, 1984, Ser. No. 663,132

Int. Cl.[4] A61M *5/20*

U.S. Cl. 604—156 **6 Claims**



6. A bio-medical injector apparatus comprising:

a base unit;

carriage means reciprocally secured to the base unit;

hypodermic needle removably secured to the carriage means and movable simultaneously therewith;

sensing means for detecting the presence of blood on the hypodermic needle; and,

means responsive to said sensor means for stopping the operation of the hypodermic needle upon detecting said blood.

4,613,329

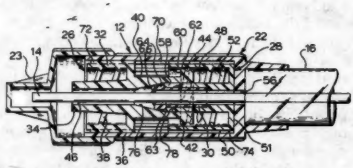
CATHETER PLACEMENT DEVICE

Raymond O. Bodicky, Oakville, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 30, 1983, Ser. No. 537,913

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—158 **21 Claims**



1. A catheter placement device comprising a first adapter having a bore therethrough, a luer connector at the distal end thereof connectable with a luer connector of an introducer cannula insertable into a vessel of a patient, a second adapter having a bore therethrough, an elastomeric grommet having a bore therethrough, a flexible catheter extending through said grommet bore and said adapter bores for insertion into an introducer cannula and vessel of a patient, the bore of one of said adapters being tapered with radially inwardly tapering sidewalls, said grommet being disposed in the bore of the other of said adpaters and extending into the bore of said one adpater, means for threadedly coupling said adapters to each ther, said grommet being movable toward the narrower end of said tapered bore and into increased frictional engagement with said catheter to thereby lock said catheter against axial movement relative to said adapters in response to predetermined relative rotation of said adapters, a flexible protective sleeve surrounding said catheter and being longitudinally collapsible to permit distal movement of said catheter through said grommet and adapter bores when a portion of said sleeve is manually pinched about said catheter and said sleeve portion and said catheter are moved distally relative to said adapters, and a cylindrical connector connected to the distal end of said sleeve and having a splined inner surface, said adapters having splined outer surfaces receivable in said connector with the

splined surfaces of said adapters disposed in splined connection with the splined inner surface of said connector, said connector being slidable from each of said adapters.

4,613,330

DELIVERY SYSTEM FOR DESIRED AGENTS

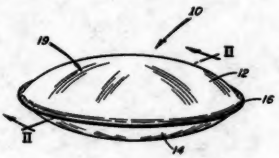
Paul E. Michelson, 2280 Calle Tiara, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 444,376, Nov. 26, 1982, Pat. No. 4,478,596. This application Oct. 18, 1984, Ser. No. 662,185

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—890 **16 Claims**



1. A system for the controlled delivery of a desired agent to a fluid environment comprising:

a semipermeable container defining a fully enclosed cavity and being imperforate except for a plurality of pores for permitting the flow of fluid between the fluid environment and said cavity; and

a quantity of molecular complex positioned in said cavity, said molecular complex comprising a macromolecule that is nondiffusable with respect to said container and a desired agent complexed to said macromolecule, said agent being capable of dissociating from said macromolecule over time, said pores having a larger size in relation to said agent and said container being so constructed as to permit unimpeded passage of said agent through said pores, wherein the concentration of said agent within said cavity is controlled by the equilibrium between said molecular complex and said agent within said cavity and said agent is deliverable by said system to the fluid environment exclusively through said plurality of pores.

4,613,331

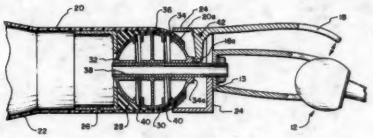
ARTICULATED PROSTHETIC WRIST

Stephen C. Jacobsen, Salt Lake City; Harlan R. Wright, deceased, late of Salt Lake City, both of Utah, and by Gail J. Pendell, general personal representative, La Mesa, Calif., assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 5, 1984, Ser. No. 658,192

Int. Cl.[4] A61F *2/58*

U.S. Cl. 623—61 **32 Claims**



1. An articulated artificial wrist for use with a hand prosthesis, comprising:

contractible ball means, said ball means comprising two semispherical ball members and bias means positioned between the semispherical ball members so as to bias the two semispherical ball members apart to a normally expanded configuration;

connecting means having proximal and distal ends, said proximal end being secured to the ball means and said distal end being secured to the hand prosthesis;

socket means for receiving the ball means, said socket means adapted to secure the ball means in a desired orientation when the ball means is in the normally expanded configuration;

means for contracting the ball means such that, when contracted, said two semispherical ball members are both released from engagement with said socket means and the ball means is capable of being positioned within the socket means; and

means for securing said socket means to a limb prosthesis for attachment to the remaining portion of an amputated limb.

27. A method for positioning an artificial hand at a desired orientation with respect to an artificial forearm, comprising the steps of:

providing a prosthetic arm including artificial hand means secured to contractible ball means and socket means adapted to receive the ball means secured to artificial forearm means, said ball means being biased to a normally expanded configuration within the socket means so as to be secured in a desired orientation with the socket means;

contracting the ball means so that the ball means is released from engagement with the socket means and is capable of being repositioned within the socket means together with repositioning of the artificial hand means attached thereto;

positioning the artificial hand means to a desired orientation; and

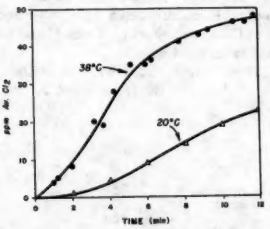
causing the ball means to re-expand within the socket means so as to secure the ball means at its new orientation within the socket means.

4,613,332

CONTROLLED GENERATION HYPOCHLORITE COMPOSITIONS AND METHOD

Victor M. Casella, Martinez, and Ronald A. Fong, Modesto, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jul. 11, 1984, Ser. No. 629,695
Int. Cl.[4] D06L *3/02, 3/04;* C11D *3/395, 7/54*
U.S. Cl. 8—111 24 Claims



1. A bleaching composition comprising:

from about 5 wt.% to about 80 wt.% of a peroxygen bleaching agent selected from the group consisting essentially of water-soluble monopersulfates and water-soluble monoperphosphates;

from about 10 wt.% to about 70 wt.% of a water-soluble chloride salt; and,

an activator in an amount of from about 0.1 wt.% to about 10.0 wt.% of the composition to promote reaction in an aqueous solution between the peroxygen bleaching agent and the chloride salt and to produce hypochlorite therefrom, the activator selected from the group consisting essentially of an aromatic diol, or a hydrolyzable ester thereof, benzoquinone or a substituted benzoquinone.

4,613,333

SILICONE DURABLE PRESS TEXTILE TREATMENT PROCESS AND RESULTING PRODUCT

James E. Hendrix, Spartanburg, S.C.; John Y. Daniels, Pineville, and Taryn M. White, Charlotte, both of N.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Continuation-in-part of Ser. No. 529,042, Sep. 2, 1983, Pat. No. 4,549,880. This application Apr. 5, 1985, Ser. No. 720,138
Int. Cl.[4] B32B *27/26;* D06M *15/30, 15/66*
U.S. Cl. 8—115.7 10 Claims

1. A process of treating textile materials containing cellulosic fibers to provide durable press and fabric stabilization properties, said process comprising applying to the material a durable press finishing agent consisting essentially of a silicone compound and a silicone fragmentation reactant selected from the group consisting of an acid or alkali compound in an effective amount to fragment the silicone compound when exposed to curing conditions, the concentration of said silicone compound in said finishing agent being about 3 to 30 percent by weight and the concentration of said silicone fragmentation reactant being about 1 to 15 percent by weight, and thereafter subjecting the textile material to curing conditions to fragment the silicone compound and react and crosslink the durable press finishing agent with the cellulosic fibers to impart said durable press and fabric stabilization properties to the fabric.

5. A process of treating textile materials containing cellulosic fibers to provide durable press properties, said process comprising impregnating the material with a durable press finishing agent consisting essentially of a siloxane compound and a silicone fragmentation reactant in an effective amount to fragment the siloxane compound when exposed to heated conditions, the concentration of said silicone compound in said finishing agent being about 3 to 30 percent by weight and the concentration of said silicone fragmentation reactant being about 1 to 15 percent by weight, steaming the impregnated material to enhance the reaction of the siloxane compound with the cellulosic fibers, rinsing the impregnated and steamed textile material, and thereafter drying and curing the impregnated and steamed textile material to thereby fragment the siloxane compound and react and crosslink the durable press finishing agent with the cellulosic fibers to impart said durable press properties to the fabric.

6. A textile material formed at least partially of cellulosic fibers and which has been treated by the process of claim 1, 2 or 5.

4,613,334

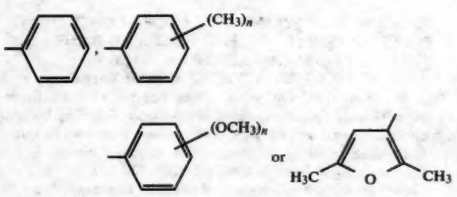
LIGHTFASTNESS OF DYEINGS OBTAINED WITH ACID DYES OR METAL COMPLEX DYES ON POLYAMIDES

Michael Thomas, Weisenheim; Peter Neumann, Wiesloch; Dieter Wegerle, Mannheim, and Reinhold Krallmann, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,457
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326640
Int. Cl.[4] D06P *1/64, 3/24, 5/10*
U.S. Cl. 8—442 3 Claims

1. A process for improving the lightfastness of dyeings obtained from acid dyes or metal complex dyes or a mixture thereof on polyamide textile materials by treating the materials, before, during or after dyeing, with at least one copper hydroxamate complex of the formula:

wherein R is C_1–C_8 alkyl, cyclohexyl or a radical of the formula



wherein n is 1 to 3; and R^1 is methyl, cyclohexyl or phenyl.

4,613,335

PROCESS FOR DYEING OR PRINTING CELLULOSE-CONTAINING TEXTILE MATERIAL WITH VAT DYE FOAM

Hans-Ulrich Berendt, Allschwil, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 13, 1985, Ser. No. 733,346
Claims priority, application Switzerland, May 18, 1984, 2456/84
Int. Cl.[4] D06P *1/22, 3/60*
U.S. Cl. 8—477 24 Claims

1. A process for dyeing or printing cellulose-containing textile materials with vat dyes, which comprises contacting the

textile material with an aqueous preparation, which is foamed in the absence of air, and which contains dye, foam-forming agent, alkali, reducing agent and a homopolymer or copolymer of acrylamide or methacrylamide or a graft polymer which comprises an adduct of an alkylene oxide on an at least trihydric aliphatic alcohol having 3 to 10 carbon atoms and acrylamide or methacrylamide.

4,613,336

KNITTED FABRIC PRODUCED FROM INDIGO-DYED YARN

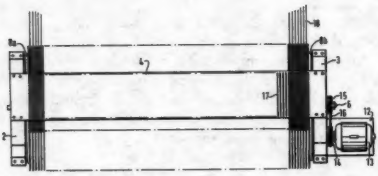
Michael Quinnen, 124 Alexandra Road, Wimbledon, London, England SW19 7JY

Continuation-in-part of Ser. No. 507,453, Jun. 24, 1983, abandoned. This application Oct. 3, 1984, Ser. No. 657,240

Claims priority, application United Kingdom, Jun. 3, 1983, 8315210; Jan. 19, 1984, 8401370

Int. Cl.[4] D06P *5/00;* **C09B** *7/00*

U.S. Cl. 8—494 **5 Claims**



1. A fabric produced by the steps of:

(a) subjecting a rope consisting of a plurality of individual cotton yarn threads to a plurality of exposures to an indigo dye liquor,

(b) oxidizing the dye between the said exposures,

(c) separating the individual yarn threads of the rope, and winding the separated yarn threads onto a plurality of supports, each carrying no more than a small group of the said individual yarn threads, and

(d) utilizing the said wound and separated yarn threads to produce a knitted indigo-dyed fabric.

4,613,337

PROCESS FOR DYEING CELLULOSE-CONTAINING FIBRE MATERIALS BY THE COLD PAD-BATCH OR PAD-STEAM METHOD: MALEIC ANHYDRIDE-STYRENE COPOLYMER

Udo W. Hendricks, Odenthal; Klaus Lesche, Overath-Brombach; Günter Sackmann, and Wolf-Dieter Schröer, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,227

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3417937

Int. Cl.[4] D06P *1/52, 3/66*

U.S. Cl. 8—543 **16 Claims**

1. Process for dyeing cellulose fibres or fibre blends containing cellulose fibres with reactive dyestuffs by a cold pad-batch or pad-steam method, characterised in that the fibres are treated with aqueous padding liquors which contain water-soluble reaction products of copolymers of maleic anhydride and ethylene, propylene, isobutylene, diisobutylene or styrene with ammonia or amines of the formula

I

in which

R^1 and R^2 stand for hydrogen, C_1–C_4-alkyl or C_1–C_4-hydroxyalkyl.

4,613,338

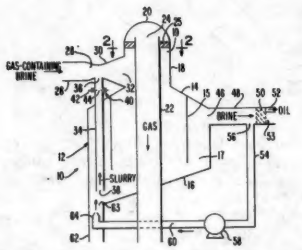
SEPARATING GASES FROM GEOPRESSURED OR HYDROPRESSURED BRINE

Alfred N. Rogers, Pleasanton, and Leon Awerbuch, San Francisco, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed May 5, 1983, Ser. No. 491,685

Int. Cl.[4] B01D *19/00, 9/02*

U.S. Cl. 23—301 **1 Claim**



1. A method of separating gases from geopressured or hydropressured brine comprising: moving incoming geopressured or hydropressured brine along a circular path into a first zone to cause separation of gases from the remainder of the brine by centrifugal force; allowing the separated gases to move in one direction to a second zone while permitting the remainder of the brine to gravitate to a third zone; removing the separated gases from the second zone; dividing the remainder of the brine into a clarified liquid fraction and a slurry; removing the clarified liquid fraction from the third zone; moving a portion of the slurry in the third zone into the path of flow of the incoming brine flowing toward the first zone and directing a portion of the clarified brine into the slurry in the second zone to cause elutriation in the second zone.

4,613,339

PROCESS FOR PREPARING AND USING SWEET SORGHUM IN A FUEL PRODUCT

Rudolf W. Gunnerman, 2800 City View, Eugene, Oreg. 97401, and William A. Farone, 9519 Groundhog Dr., Richmond, Va. 23235

Filed Dec. 24, 1984, Ser. No. 685,851

Int. Cl.[4] C10L *5/44*

U.S. Cl. 44—1 D **5 Claims**

1. A method of storing sweet sorghum preparatory to pelletizing it for use as a combustible fuel product comprising:

removing a majority of sugar-containing fluid from said sorghum to leave a residue of ligno-cellulosic bagasse;

piling said bagasse on a hard surface;

compressing said piled bagasse to form a compacted mass, whereby said compressing frees air trapped within said bagasse to inhibit microbial and fungal oxidative degradation thereof; and

storing said compacted mass preparatory to pelletizing the same.

4,613,340

RESIDUAL OIL SLUDGE DISPERSANT

Otis L. Nelson, Jr., and Mark L. Nelson, both of Bay City, Mich., assignors to Polar Molecular Corp., Saginaw, Mich.

Continuation of Ser. No. 569,160, Jan. 9, 1984, Pat. No. 4,516,981. This application May 10, 1985, Ser. No. 732,574
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.[4] C10L 1/02
U.S. Cl. 44—53 3 Claims

1. A residual oil sludge dispersant comprising a low molecular weight alkyl alcohol; a glycol ether; and a polyethoxylated compound, said alcohol present in an amount of 10–50 percent by weight, said glycol ether comprising a glycol alkyl monoether present in an amount of 5–50 percent by weight, and said ethoxylated compound being present in an amount of 25–80 percent by weight.

3. In combination;

a residual oil having sludge and water;

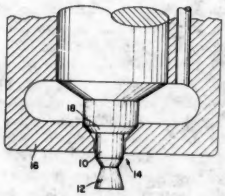
and a dispersant in an amount of 1 part of dispersant to 1,000–4,000 parts of oil consisting essentially of a low molecular weight alcohol in an amount of 10–50 percent by weight, a glycol ether in an amount of 5–50 percent by weight, and a polyethoxylated compound in an amount of 25–80 percent by weight, wherein the dispersant disperses sludge and precipitates out water from the residual oil.

4,613,341

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 31, 1985, Ser. No. 739,834
Int. Cl.[4] C10L 1/22
U.S. Cl. 44—57 18 Claims



1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) an additive selected from the group consisting of alkenyl substituted succinimide, alkenyl substituted succinamide and mixtures thereof wherein said alkenyl substituent contains about 12–36 carbon atoms, said additive being made by the process comprising (a) isomerizing the double bond of an α-olefin containing about 12–36 carbon atoms to obtain a mixture of internal olefins, (b) reacting said mixture of internal olefins with maleic acid, anhydride or ester to obtain an intermediate alkenyl substituted succinic acid, anhydride or ester, and (c) reacting said intermediate with ammonia to form a succinimide, succinamide or mixture thereof, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,613,342

HYDROCARBYL SUBSTITUTED CARBOXYLIC ACYLATING AGENT DERIVATIVE CONTAINING COMBINATIONS, AND FUELS CONTAINING SAME

Casper J. Dorer, Jr., Lyndhurst, and Katsumi Hayashi, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 711,114, Mar. 12, 1985, Pat. No. 4,575,526, which is a division of Ser. No. 404,845, Aug. 9, 1982, Pat. No. 4,564,460. This application Oct. 16, 1985, Ser. No. 787,940
Int. Cl.[4] C10L 1/14
U.S. Cl. 44—62 2 Claims

1. A distillate fuel oil composition comprising a major amount of a normally liquid fuel and a pour-point depressant amount of:

a copolymer of ethylene and vinyl acetate, said copolymer having about 30 to about 40% by weight vinyl acetate, a number average molecular weight in the range of about 1500 to about 3000, and about 3 to about 6 methyl terminating side branches per 100 methylene groups; and

the reaction product of a hydrocarbyl-substituted succinic anhydride with a mixture of aminopropylmorpholine and diethylenetriamine, the hydrocarbyl substituent of said succinic anhydride being a polymer of C_{15-18} alpha-olefins, the number average molecular weight of said substituent being in the range of about 2000 to about 8000.

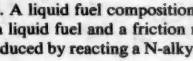
4,613,343

N-ALKOXYALKYLENEDIAMINE [ORGANIC ACID REACTION PRODUCTS] DIAMIDES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Robert M. Gemmill, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 508,979, Jun. 29, 1983. This application Aug. 20, 1985, Ser. No. 767,573
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] C10L 1/22, 1/18
U.S. Cl. 44—71 17 Claims

6. A liquid fuel composition comprising a major porportion of a liquid fuel and a friction reducing amount of the product produced by reacting a N-alkylalkylenediamine of the formula:



with an acid of the formula

$$R^3COOR^3$$

wherein R is a hydrocarbyl group containing from 6 to 20 carbon atoms, R^1 and R^2 are C_2 to C_3 hydrocarbylene groups and R^3 is hydrogen or a C_1 to C_3 alkyl group at a temperature of about 80° C. to about 260° C., and a molar ratio of diamine to acid of about 10:1 to 0.5:1 respectively.

4,613,344
METHOD AND APPARATUS FOR CLEANING HOT GASES PRODUCED DURING A COAL GASIFICATION PROCESS

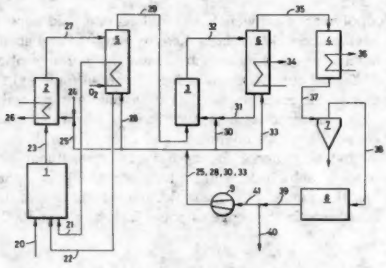
Günter Henrich, Leverkusen; Harald Hoffmann, Much; Heinz-Dieter Waldhecker, Rösrath, and Klaus-Peter Mey, Frechen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 31, 1984, Ser. No. 666,631

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 3340204

Int. Cl.[4] C10J *3/56*

U.S. Cl. 48—77 **10 Claims**



1. In a method for cleaning hot gases produced during a coal gasification process in a reactor wherein the hot gases leaving said reactor are cooled in a plurality of cooling stages to a relatively low temperature, the improvement which comprises:

adding $CaCO_3$ to the hot gases in a first stage, adding Al_2O_3 to said gases in a later stage and circulating the added solids in suspension in said gases in separate stages of said plurality of stages.

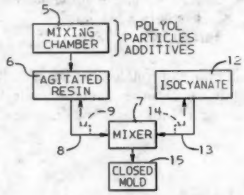
4,613,345
FIXED ABRASIVE POLISHING MEDIA

Ricky P. Thicke, Stewartville; Stanley B. O'Brien, Hayfield; David M. Nordyke; Dennis L. Fox, both of Rochester; Thomas E. Folkert, Hammond, and Bruce R. Diemer, LeRoy, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1985, Ser. No. 764,909

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 **10 Claims**



1. The method of making a polishing pad for superfinishing metal substrate surfaces comprising

fast mixing at a temperature of less than 120 degrees Fahrenheit the following ingredients in parts by weight:

approximately 50 parts polyol

approximately 100 parts abrasive particles

0.35 to 0.50 parts water

0.95 to 1.05 parts hydrophobic silicone surfactant

0.05 to 0.2 parts hydrophilic silicone surfactant

0.8 to 0.9 parts catalyst;

preheating a mold to 85 to 105 degrees Fahrenheit;

mixing the above initial mixture with approximately 50 parts by weight of isocyanate to form a final mixture and delivering said final mixture to said preheated mold; and

curing said final mixture for 25 minutes at a temperature not exceeding 275 degrees Fahrenheit.

4,613,346
ENERGY CONTROL FOR ELECTROSTATIC PRECIPITATOR

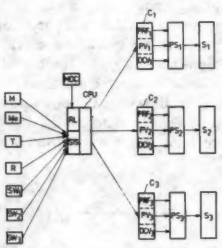
Victor Reyes, Copenhagen, and Eigil Kristensen, Ballerup, both of Denmark, assignors to F. L. Smidth & Co., Denmark

Continuation of Ser. No. 520,809, Aug. 5, 1983, abandoned. This application Sep. 25, 1985, Ser. No. 781,195

Claims priority, application Denmark, Aug. 9, 1982, 3553/82

Int. Cl.[4] B03C *3/68*

U.S. Cl. 55—4 **11 Claims**



1. A method of controlling an electrostatic precipitator for reducing the dust content of exit gas from a plant which includes one or more precipitator sections, said method comprising charging each of said sections from a separate independent power supply for supplying a controllable high DC-voltage thereto, superimposing on said DC-voltage controllable high voltage pulses at a controllable repetition frequency, controlling the entire electrostatic precipitator towards minimum energy consumption at a certain set dedusting efficiency, by measuring the dust content in the exit gas from the entire precipitator and regulating the dedusting efficiency of the entire precipitator upwardly or downwardly depending on whether said measured dust content is above or below a preset value, the regulation being made through controlling the running parameters of one or more of the power supplies within set limits according to a control strategy selected among a plurality of predefined stored control strategies, each said control strategy comprising a sequence of instructions as to in what order, in which way and within which limits the DC-voltage, the pulse voltage and the pulse frequency of the respective power supplies of said precipitator sections are regulated, said dust content measurement determining if the instructions should be followed in forward or in reverse order, and how far the sequence of instructions should be followed.

4,613,347
WATER DEAERATION PROCESS

Jean. P. Ranchet, Louveciennes, and Eric Serval, Boulogne, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed May 21, 1985, Ser. No. 736,508

Claims priority, application France, Jun. 6, 1984, 84 08827

Int. Cl.[4] B01D *19/00*

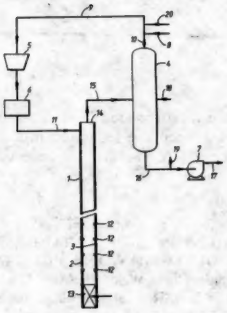
U.S. Cl. 55—53 **7 Claims**

1. A process for removing dissolved oxygen from water, comprising the steps of:

(a) immersing an elongate tubular column in a volume of naturally existing water such that said column assumes a generally vertical orientation, said column having an open

lower end provided with an electrical pump for lifting water standing in the column and an upper, exit end,

(b) injecting nitrogen gas into the column at a lower portion thereof, above the pump, and at a pressure no greater than the hydrostatic pressure of the water in the column at the site of injection, and



(c) simultaneously with step (b), operating the pump to lift the water upwardly in the column such that the pump supplies a majority of the energy required to lift the water,

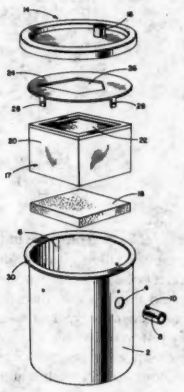
(d) whereby oxygen dissolved in the water is released into rising and naturally expanding bubbles of nitrogen.

4,613,348

DISPOSABLE HEPA FILTRATION DEVICE

Anthony Natale, R.D. 2, Ark Rd., Box 2350, Mount Holly, N.J. 08060

Filed Feb. 22, 1985, Ser. No. 704,508
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—318 **16 Claims**



1. A sealed filter device for filtering asbestos contaminated air sucked through said device comprising

a sealed contact having a sealed top, bottom, and sides, whereby said sealed cannister may be adapted to be disposed of after a predetermined amount of use,

filter means supported within said cannister and spaced above said bottom, said filter means including a filter casing, a HEPA filter and a prefilter,

an inlet to the interior of the cannister located upstream from said prefilter whereby particles, sucked into the sealed cannister which are too large to pass through said prefilter will collect adjacent the bottom of the sealed cannister,

sealing means for sealing said inlet against passage of air out of said sealed cannister and allowing passage of air into said sealed cannister when the interior of said sealed cannister is subjected to a suction force, and

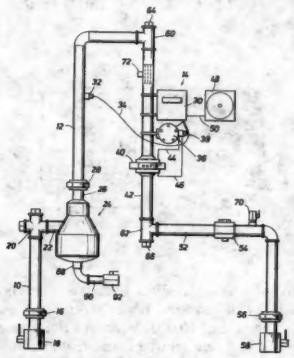
outlet means for the sole egress of air from said sealed cannister being in communication with said HEPA filter for exiting air passing through said filter means.

4,613,349

FLUID SEPARATOR AND FLOW STABILIZATION STRUCTURE

Donald J. Drapp, Missouri City, and Paul S. Cabler, Shiner, both of Tex., assignors to Mini Base Systems, Inc.

Filed Oct. 19, 1984, Ser. No. 662,533
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—458 **18 Claims**



1. A flow stabilization mechanism adapted to be coupled into a gas flowline upstream of flow measurement equipment for separation of liquid material and solid particulate from flowing gas and developing a back pressure to gas flow to minimize rapid fluctuations of flowing gas being measured, comprising:

(a) vessel wall structure having a small diameter upper annular portion, a large diameter lower annular portion and a downwardly diverging tapered intermediate annular portion interconnecting said upper and lower annular portions, said vessel wall structure defining vessel chamber means;

(b) said vessel wall structure of said downwardly diverging intermediate annular portion forming generally conical surface means defining fluidic column means within said vessel chamber means;

(c) inlet passage means interconnected with said intermediate annular portion of said vessel wall structure and extending into said vessel chamber means and adapted to be coupled with said flowline, said inlet means defining a restricted gas jet orifice of smaller dimension than the flow path dimension of said inlet passage means and directing flowing gas within said fluidic column means in the form of a jet directed at a shallow tangential angle to said generally conical surface means of said vessel wall structure and at increased velocity in comparison with the velocity of gas flow through said inlet passage means, thereby generating cyclonic circulation of gas within said intermediate annular portion of said vessel chamber means;

(d) said large diameter lower annular portion of said vessel wall structure defining sump means forming a portion of said vessel chamber means and being located below said fluidic column means, said sump means having outlet

means for removal of liquid material and solid contaminants separated from said flowing gas in said fluidic column means; and

(e) outlet passage means extending through said small diameter upper annular portion of said vessel wall structure and defining an outlet opening located centrally of said small diameter upper annular portion and above the upper extremity of said generally conical surface means and in spaced relation with said vessel wall structure, said outlet passage means adapted to be coupled with said flowline.

4,613,350

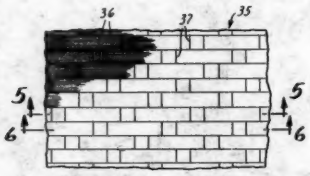
UNIFORM MINIMUM-PERMEABILITY WOVEN FABRIC, FILTER, AND PROCESS THEREFOR

Roger J. Forester, S. St. Paul, and Lloyd R. White, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 640,154, Aug. 10, 1984, Pat. No. 4,543,113. This application Apr. 24, 1985, Ser. No. 726,516

Int. Cl.[4] C03B *25/00*; B01D *46/00*

U.S. Cl. 65—2 **17 Claims**



1. A woven ceramic or glass fiber fabric having a uniform gas permeability of less than 1.5 L/M/cm^2 and being capable of withstanding at least 10,000 cycles in a Bally TM Flexometer test without failure, said fabric being capable of maintaining its integrity for prolonged periods at elevated temperatures, and said fabric having essentially no visible spaces or openings present between the yarns at a magnification of 7.5 times, said fabric being prepared by a process comprising the steps:

a. providing sized, woven ceramic or glass fiber fabric,

b. subjecting said fabric in a dry condition to a sequence of steps comprising:

(1) heat cleaning said fabric at a temperature and for a time sufficient to remove all undesired organic materials,

(2) tumbling said fabric at room temperature so as to consolidate the fibers to fill in spaces in said fabric and reduce permeability of said fabric to fluids to a uniform minimum value; and

(3) heat treating said fabric at a temperature and for a time period sufficient to heat set said fabric.

4,613,351

SOLID MATERIAL HAVING SPECIAL ELECTRICAL PROPERTIES AND A METHOD FOR ITS PREPARATION

Reimar Spohr, Darmstadt, Fed. Rep. of Germany, assignor to Gesellschaft für Schwerionenforschung mbH Darmstadt, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 660,203, Oct. 12, 1984. This application Jun. 26, 1985, Ser. No. 748,953

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337049

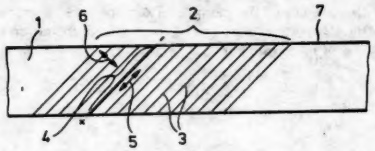
Int. Cl.[4] C03B *32/00*

U.S. Cl. 65—22 **6 Claims**

1. Method for producing a solid material that is electrically conductive in one direction and electrically insulating in any direction perpedicular to the one direction, comprising:

(a) producing a layer of metastable glass supersaturated with a metal,

(b) irradiating the layer at an angle to its surface with heavy ions of a predetermined energy, type of ion and area dosage, and



(c) tempering the irradiated layer or maturing the formed metal nuclei until the separated (discrete) metal aggregrates merge to form metallic filaments.

4,613,352

DISPLACEMENT PICK-UP ARRANGEMENT FOR THE POSITION DETECTION OF A PRESSING PLUNGER

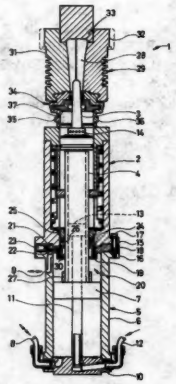
Manfred Krumme, Porta Westfalica, and Gerhard Geisel, Bückeburg, both of Fed. Rep. of Germany, assignors to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,972

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401465

Int. Cl.[4] C03B *11/16*

U.S. Cl. 65—158 **11 Claims**

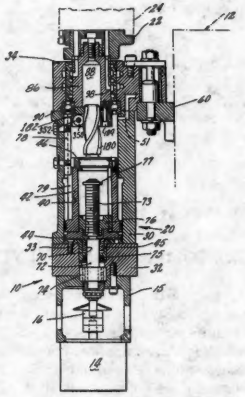


1. A displacement pick-up arrangement for means for adjusting the mass of gobs of molten glass or another thermoplastic material which are successively severed from a stream of said material and supplied into a mold of a forming machine and after this positively deformed by a pressing plunger mounted on a piston rod of a piston moveable in a cylinder of a cylinder-piston unit; the pick-up arrangement comprising a coil fixed relative to said cylinder and a metallic actuating element fixed relative to said piston and cooperating with said coil for changing the inductivity of said coil in dependence on relative axial displacement between the piston and the cylinder; said adjusting means comprising a first control circuit electrically connected with said displacement pick-up arrangement for controlling a dosing element for adjusting the mass of the gobs; said coil being arranged in the region of an end of said cylinder through which said piston rod extends so that said coil surrounds the piston rod; and said actuating element being formed as a ring-shaped core which is arranged at that side of said piston, which faces toward said plunger, and is entirely or partially moveable into said coil and back out again.

4,613,353
CONVOLUTED SHAFT ACTUATOR LINK FOR GLASSWARE FORMING MACHINE

Gary R. Voisine, Hartford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 17, 1985, Ser. No. 724,364
Int. Cl.[4] C03B 9/40
U.S. Cl. 65—163 7 Claims



5. An apparatus for arcuately moving a pusher cylinder of a glassware making machine along a predetermined arcuate path to move at least one article from a dead plate onto a moving conveyor comprising:

a cylinder;

a piston movable within said cylinder;

a motor;

a threaded shaft for being rotated by said motor;

a control nut in threaded engagement with said threaded shaft for being longitudinally moved by the rotation thereof;

means enabling contiguous engagement of said control nut with said piston during motion thereof in a predetermined direction;

a convoluted shaft secured to said piston for linear motion therewith;

a rotatable hub having roller bearings in engagement with said convoluted shaft for imputation of rotational motion thereto; and

a mounting plate secured to said hub, said mounting plate adapted to support said pusher cylinder.

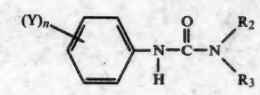
4,613,354
COMPOSITION FOR DEFOLIATING PLANTS

Reinhart Rusch, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,725
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222622
Int. Cl.[4] A01N 43/82
U.S. Cl. 71—73 15 Claims

1. A composition for defoliating cotton plants and having a synergistic effect comprising:

(a) a compound of the Formula (I)



in which

R_2 is hydrogen or C_1 to C_4 alkyl;

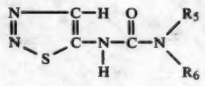
R_3 is hydrogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, or C_3 to C_8 cycloalkyl;

Y can be the same or different and is hydrogen, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, or trifluoromethyl; and

n is the number 1 or 2;

in combination with

(b) a compound of the Formula (II)



in which

R_5 is hydrogen or C_1 to C_4 alkyl; and

R_6 is phenyl, methylphenyl, or pyridyl;

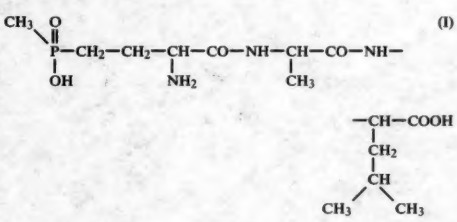
wherein the weight ratio of compound of the Formula (I) to the compound of the Formula (II) is 1:1 to 10:1.

4,613,355
ANTIBIOTIC HAVING HERBICIDAL ACTIVITY

Satoshi Omura, 5-12-7, Seta, Setagaya-ku, Tokyo-to; Haruo Tanaka, Tokyo; Kiyoizumi Hinotozawa, Tokyo; Masatsune Murata, Tokyo, and Yuzuru Iwai, Chiba, all of Japan, assignors to Satoshi Omura, Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,643
Claims priority, application Japan, Aug. 2, 1983, 58-141401; Feb. 15, 1984, 59-141401; Mar. 2, 1984, 59-41065
Int. Cl.[4] A01N 57/00; C07K 5/08
U.S. Cl. 71—86 9 Claims

1. A compound of the formula



(I)

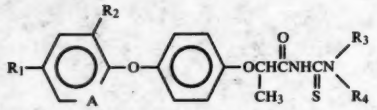
and salts thereof.

4,613,356
ARYLOXYPHENOXY PROPIONYLTHIOUREAS WHICH ARE USEFUL AS HERBICIDES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

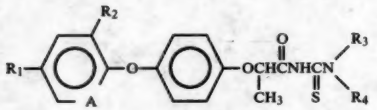
Filed Aug. 6, 1984, Ser. No. 637,983
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] A01N 43/40, 31/00, 38/08; C07D 211/72
U.S. Cl. 71—94 20 Claims

1. A substituted aryloxyphenoxy-propionyl thiourea compound having the formula



wherein R_1 is CF_3 or halogen; R_2 is H or halogen; A is CH or N; R_3 and R_4 are each independently hydrogen or lower alkyl, alkenyl or alkynyl groups having up to 5 carbon atoms.

13. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula



wherein R_1 is CF_3 or halogen; R_2 is H or halogen; A is CH or N; R_3 and R_4 are each independently hydrogen or lower alkyl, alkenyl or alkynyl groups having up to 5 carbon atoms.

4,613,357

N,N-DISUBSTITUTED HYDROXYLAMINE ESTERS OF SUBSTITUTED PYRIDYLOXYPHENOXYPROPIONIC ACIDS AND HERBICIDAL METHODS OF USE

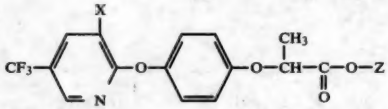
Charles G. Carter, El Sobrante, and David L. Lee, Martinez, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 484,819, Apr. 13, 1983, abandoned. This application Nov. 26, 1984, Ser. No. 674,884

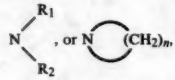
Int. Cl.[4] C07D *213/64, 401/12;* **A01N** *43/40, 43/46*

U.S. Cl. 71—94 **21 Claims**

1. As new compounds, N,N-disubstituted hydroxylamine esters of substituted pyridyloxyphenoxy propionic acids having the formula

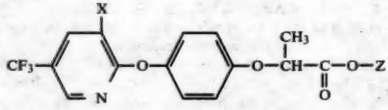


wherein X is hydrogen or chlorine and Z is

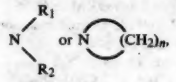


wherein R_1 and R_2 are the same or different and are straight or branched chain lower alkyl groups having from 1 to 6 carbon atoms, and n is 4 to 6.

14. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula



wherein X is hydrogen or chlorine and Z is



wherein R_1 and R_2 are the same or different and are straight or branched chain lower alkyl groups having from 1 to 6 carbon atoms, and n ranges from 4 to 6.

4,613,358

HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

Daniel L. Hyzak, Austin, Tex., and Reed A. Gray, Saratoga, Calif., assignors to Stauffer Chemical Co., Westport, Conn.

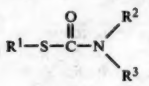
Continuation-in-part of Ser. No. 496,705, May 20, 1983, abandoned, which is a continuation of Ser. No. 350,782, Feb. 22, 1983, abandoned, which is a continuation of Ser. No. 163,651, Jun. 27, 1980, abandoned. This application Mar. 23, 1984, Ser. No. 592,687

Int. Cl.[4] A01N *25/22*

U.S. Cl. 71—100 **11 Claims**

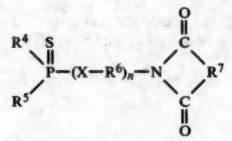
1. An herbicidal composition comprising

(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which R^1, R^2, and R^3 are independently C_2–C_4 alkyl with the proviso that wherein R^1 is ethyl and R^2 is propyl, R^3 is other than propyl; and

(b) an amount of an organophosphorus compound sufficient to extend the soil life of said thiolcarbamate, said organophosphorus compound having the formula



in which

R^4 is selected from the group consisting of C_1–C_4 alkyl and C_1–C_4 alkoxy;

R^5 is selected from the group consisting of C_1–C_4 alkoxy, C_1–C_4 alkylthio, and C_2–C_4 alkenylthio;

R^6 is selected from the group consisting of phenyl, C_1–C_4 alkylene, and C_2–C_4 alkylthioalkylene;

R^7 is either phenyl or cyclohexenyl;

X is oxygen or sulfur, and

n is zero or one,

with the proviso that wherein R^4 and R^5 are each ethoxy, R^6 is phenyl, X is oxygen and n is one, the thiocarbamate is other than S-ethyl N,N-diisobutyl thiocarbamate.

4,613,359

FLOWER-THINNING AGENT FOR FRUIT TREES

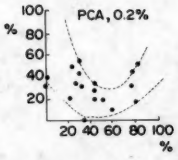
Toshihiko Yamazaki; Shoji Murase, both of Sakura; Katsuyuki Suzuki, Tsuchiura, and Makoto Iwatsuki, Yokosuka, all of Japan, assignors to Director, Fruit Tree Research Foundation and Ajinomoto Co., Ltd., both of Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,354

Claims priority, application Japan, Mar. 12, 1982, 57-37976

Int. Cl.[4] A01N *31/00*

U.S. Cl. 71—122 2 Claims



1. A method for thinning flowers of cultivated fruit trees, which comprises applying to the flowers and/or to the body of a fruit tree an effective amount of at least one 2-pyrrolidone-5-carboxylic acid, a salt thereof, a salt of an N-higher aliphatic acylated glutamic acid, sucrose monolaurate, sucrose monostearate, and a mixture of plant sterols; said mixture of plant sterols comprising sitosterol, stigmasterol, campesterol, and brassicasterol.

4,613,360

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

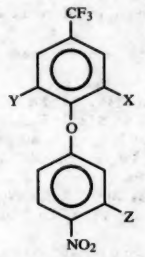
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 111,560, Jan. 14, 1980, Pat. No. 4,330,324, which is a division of Ser. No. 881,227, Feb. 22, 1978, Pat. No. 4,220,468, which is a division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929, and a continuation-in-part of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,064,798, said Ser. No. 617,560, Continuation-in-part of Ser. No. 331,719, said Ser. No. 617,562, is a division of Ser. No. 331,719, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Sep. 16, 1981, Ser. No. 302,895

Int. Cl.[4] C07C *79/34, 43/263;* A01N *31/00*

U.S. Cl. 71—124 9 Claims

1. A compound of the formula:



wherein

X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4)alkyl group

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a (C_1–C_4)alkoxy group having one or more hydrogen atoms replaced by a halogen atom.

4. A herbicidal composition which comprises a compound according to claim 1 and an agronomically-acceptable carrier.

4,613,361

HIGH-TEMPERATURE PRETREATMENT BY MEANS OF AN ALKALINE AQUEOUS SOLUTION OF ORES HAVING AN ARGILLACEOUS GANGUE CONTAINING AT LEAST ONE USABLE ELEMENT

Jean-Michel Lamèrant, Bouc Bel Air; Francois Pallez, and Pierre-Bernard Personnet, both of Aix en Provence, all of France, assignors to Uranium Pechiney, Courbevoie, France

PCT No. PCT/FR84/00110, § 371 Date Nov. 28, 1984, § 102(e) Date Nov. 28, 1984, PCT Pub. No. WO84/04333, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 18, 1984, Ser. No. 686,267

Claims priority, application France, Apr. 27, 1983, 83 07223; Sep. 21, 1983, 83 15271

Int. Cl.[4] C22B *1/00*

U.S. Cl. 75—2 16 Claims

1. A process for high temperature pretreatment by means of an aqueous pretreatment solution, of crushed ores containing at least one metal element, whose gangue contains argillaceous compounds which, in an attack operation of the ore, are capable of forming a stable plastic suspension in the presence of water, which suspension cannot be subject to effective separation into liquid and solid components by filtration or settlement, comprising the steps of:

(a) adjusting the granulometry of the ore to at most equal to the liberation sieve mesh size of said at least one metal element;

(b) contacting said adjusted ore with an aqueous pretreatment solution containing at least 2×10^{-5} grams per liter of OH^- ions, the ratio of volume of said solution in cubic meters to weight of ore in tonnes, being at least about 2;

(c) immediately increasing the temperature of said pretreatment solution in contact with said ore to a pretreatment temperature of at least 120° C. in a pressurized vessel, the period of time of the increase being at most 30 minutes reckoned from the time at which said ore is contacted with said aqueous pretreatment solution;

whereby the argillaceous gangue is stabilized, and whereby liquid and solid components can be easily separated after said attack operation of said ore.

4,613,362

METHOD OF MAKING MAGNESIUM-CONTAINING METAL GRANULATE FOR THE STORAGE OF HYDROGEN

Jean-Marie Welter, Aachen, Fed. Rep. of Germany, and Peter Rudman, Ringwood, N.J., assignors to Kernforschungsanlage Julich, Julich, Fed. Rep. of Germany

Division of Ser. No. 445,708, Dec. 1, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,636

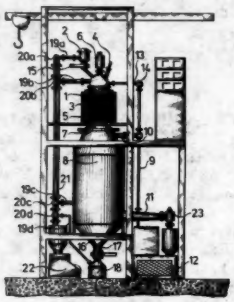
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 31478395

Int. Cl.[4] C22C *1/04*

U.S. Cl. 75—0.5 B 12 Claims

1. A process for the production of a magnesium-containing metal granulate which is adaptable for the storage of hydrogen, comprising adding a catalytically effective amount of iron or a ferriferous alloy to molten magnesium or a molten magnesium-containing alloy to obtain a ferriferous magnesium or a ferriferous magnesium alloy and granulating said ferriferous magnesium or ferriferous magnesium alloy thereby forming a catalytically active surface upon said granulated ferriferous

magnesium or ferriferous magnesium alloy, said catalytically active surface promoting the storage of hydrogen by said



granulated ferriferous magnesium or ferriferous magnesium alloy.

4,613,363

PROCESS OF MAKING SILICON, IRON AND FERROALLOYS

Fritz O. Wienert, 394 Roosevelt Ave., Niagara Falls, N.Y. 14305

Filed Dec. 11, 1985, Ser. No. 807,498
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.62 **11 Claims**

1. A process of producing a silicon, iron or ferroalloy product which comprises the steps of:

(a) preparing a particulate, carbon-reducible oxide starting material, having a nominal particle size of less than 0.2 mm, said oxide starting material containing at least one carbon-reducible oxide of iron, silicon, manganese, chromium or nickel,

(b) mixing said oxide starting material with a sufficient amount of a particulate carbonaceous source material, having a nominal particle size of less than 0.2 mm, so that the carbon available from said carbonaceous source material is sufficient to react with said oxide starting material to produce a selected, desired product,

(c) adding a sufficient amount of water by stirring and pressing to produce a densified agglomerate product,

(d) compacting said densified agglomerate product under a maximum momentary pressure of from about 300 kg to about 4000 kg per sq cm, whereby at least 1% of said added water is squeezed out, thereby producing a compacted material, and,

(e) smelting said compacted material, as the sole feed, in a submerged arc furnace to obtain said selected, desired product.

4,613,364

METHOD AND MEANS FOR MANUFACTURING A PREFORMED METAL PRODUCT

Björn Hammarskog, Sala, Sweden, assignor to SKF Steel Engineering, A.B., Hofors, Sweden

Filed Feb. 11, 1985, Ser. No. 700,656
Claims priority, application Sweden, Aug. 2, 1984, 8403953
Int. Cl.[4] C22B *5/12*
U.S. Cl. 75—34 **8 Claims**

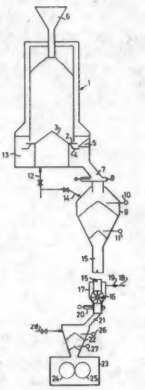
1. A method for making a preformed sponge iron product by direct reduction of ferric oxide-containing lump ore comprising

(a) charging the ore into a shaft furnace for gravity flow there through,

(b) passing a reducing gas through said ore to produce sponge iron having reducing gas in the pores thereof,

(c) introducing non-combustible gas into the bottom of said furnace under pressure to heat the gas from the excess heat of the furnace,

(d) discharging said iron and heated pressurized non-combustible gas from said furnace through a gas lock to a



preforming machine to form said preformed sponge iron product, and

(e) cooling said product, while blanketed in said non-combustible gas, to a temperature below the oxidation point of said reducing gas.

4,613,365

METHOD FOR RECOVERING PRECIOUS METALS

Hans G. Berg, Skellefteå; Sven A. Holmström, Ursviken, and Leif Johansson, Skelleftehamn, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 12, 1985, Ser. No. 775,251
Claims priority, application Sweden, Sep. 28, 1984, 8404862
Int. Cl.[4] C22B *11/00*
U.S. Cl. 75—83 **16 Claims**

1. A method for pyrometallurgically recovering the precious metal content from halogen-bearing material comprising:

(a) dispersing the material throughout an at least partially molten furnace charge containing a non-oxidic metal-containing phase capable of dissolving precious metals whereby the chemical activity thereof is lowered, precious metal is retained in the molten metal phase or forms a matte phase and halogen from the material reacts to form metal halide;

(b) separating the metal halide from the precious metal containing phase; and

(c) recovering precious metal from the precious metal containing phase.

4,613,366

CONTINUOUS REACTIVE METAL REDUCTION USING A SALT SEAL

Young J. Kwon, Fruit Heights, Utah, and Richard A. Stoltz, Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1985, Ser. No. 739,420
Int. Cl.[4] C22B *5/02*
U.S. Cl. 75—84.5 **13 Claims**

1. In a process of the type wherein a chloride of zirconium, hafnium, or titanium is reduced with magnesium to produce a product metal, and the product metal is subjected to a distillation process to remove residual magnesium and magnesium chloride; the improvement comprising:

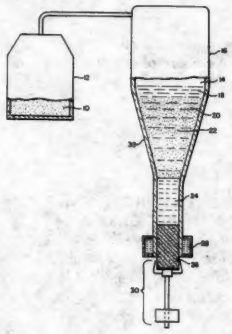
(a) establishing a layer of magnesium chloride in a vessel, magnesium chloride layer having an upper molten portion

and a lower solid portion, said lower solid portion being located adjacent to a cooling means and maintaining a liquid tight seal at the bottom of said vessel;

(b) establishing a layer of molten magnesium on top of said layer of magnesium chloride;

(c) introducing gaseous chloride of the product metal above said magnesium, thereby causing a reaction which produces product metal chunks which settle through said molten magnesium chloride and collecting on top of the solid portion of magnesium chloride;

(d) withdrawing a lower part of said solid magnesium chloride from said vessel and causing part of the molten magnesium chloride to be relocated adjacent to said cooling means, whereby the part of the molten magnesium chloride relocated adjacent to the cooling means solidifies and maintains a seal at the bottom of the vessel while product metal chunks are trapped within the solidified magnesium chloride and can be later withdrawn from said vessel together with solidified magnesium chloride; and



(e) distilling said magnesium chloride containing product metal chunks to remove the magnesium chloride and residual magnesium and melting said metal chunks to form an ingot of product metal.

4,613,367

LOW CARBON PLUS NITROGEN, FREE-MACHINING AUSTENITIC STAINLESS STEEL

John J. Eckenrod, Coraopolis; Kenneth E. Pinnow, Pittsburgh; Geoffrey O. Rhodes, Sewickley, all of Pa., and William E. Royer, Lafayette, N.Y., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Jun. 14, 1985, Ser. No. 744,627
Int. Cl.[4] C22C *38/58*
U.S. Cl. 420—42 **9 Claims**

1. A free-machining, austentic stainless steel consisting of, in weight percent,

carbon plus nitrogen both present having a total of up to 0.060

chromium 16 to 30

nickel 5 to 26

sulfur 0.25 to 0.45

manganese over 2 to about 7 and is at least about 8 times the sulfur content

silicon up to about 1

phosphorous up to about 0.50

molybdenum up to about 0.60

iron balance with incidental impurities.

4,613,368

TRI-NICKEL ALUMINIDE COMPOSITIONS ALLOYED TO OVERCOME HOT-SHORT PHENOMENA

Keh-Minn Chang, Schenectady; Shyh-Chin Huang, Latham, and Alan I. Taub, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,585
Int. Cl.[4] B22F *3/00*
U.S. Cl. 75—246 **9 Claims**

1. A process for preparing a tri-nickel aluminide base alloy having good ductility at intermediate temperatures which comprises

providing a melt of an alloy of the following composition

$$[Ni_{1-x-y}Co_x(Al_{1-u-v}Q_uR_v)_y]_{100-a-b}M_aB_b$$

wherein:

Q is at least one optional macroalloying element selected from the group consisting of silicon, niobium, vanadium, tantalum, and titanium; and u is the sum of the concentrations in which the macroalloying elements are present,

R is at least one microalloying element selected from the group consisting of niobium, hafnium, vanadium, magnesium, manganese, molybdenum and zirconium; and v is the sum of the concentrations of all of the microalloying elements present with the proviso that if niobium or vanadium is present in a concentration in excess of 0.08 it is present as a macroalloying element,

M is at least one optional fungible alloying element selected from the group consisting of iron and chromium; and the quantity, a, is the sum of the concentration between 0.0 and 15 atomic percent in which the fungible alloying elements are present,

said base alloy containing the following ingredients in the following approximate concentration values for the above expression as follows:

Ingredient	Concentration	Value
nickel	1-x-y	0.555–0.72
cobalt	x	0.05–0.20
aluminum	1-u-v	0.52–0.98
at least one microalloying element	v	0.02–0.08
at least one optional macroalloying element	u	0.0–0.40
the combination of aluminum and its substituents	y	0.23–0.245

said optional macroalloying element, Q, being selected from the group and concentrations as follows:

Element	Concentration component of u
silicon	0–0.4
niobium	0–0.28
vanadium	0–0.2
tantalum	0–0.2
titanium	0–0.2

said aluminide base alloy containing boron, B, in an amount, b, between 0.15 and 0.65 atomic percent,

rapidly solidifying the melt by atomization and

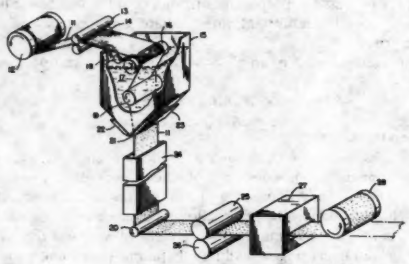
forming a body having a Ll_2 type crystal structure as a principal phase.

4,613,369

POROUS METAL ARTICLE AND METHOD OF MAKING

Paul C. Koehler, Dryden, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 625,295, Jun. 27, 1984, Pat. No. 4,562,039.
This application Sep. 30, 1985, Ser. No. 781,928
Int. Cl.[4] B22F *3/00*
U.S. Cl. 75—246 37 Claims



1. A porous metal article comprising a foraminate metal support and metal particulate contained within the openings in said support, the individual particles of said metal particulate bonded to each other and to said support and said particles are no more than one-fifth the size of the smallest dimension of the opening.

4,613,370

HOLLOW CHARGE, OR PLATE CHARGE, LINING AND METHOD OF FORMING A LINING

Manfred Held, Aresing; Alfred Leidig, Schrobenhausen; Wilhelm A. Merl, Pforzheim, and Günter Stempel, Kelkheim, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow Blohm GmbH and Bayerische Metallwerke GmbH, both of, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,342
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336516
Int. Cl.[4] C22C *27/04*
U.S. Cl. 75—248 17 Claims

1. Coating material in shaped form for use as hollow charge, plate charge lining and projectile charge coating, comprising a composite binder material formed from particles of tungsten and copper in the presence of a binder metal and having a homogeneous structure in which the individual tungsten particles are agglutinated substantially with the copper by means of the binder metal.

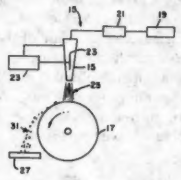
4,613,371

METHOD FOR MAKING ULTRAFINE METAL POWDER

Richard F. Cheney, Sayre, and Richard H. Pierce, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 460,709, Jan. 24, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 581,523
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—255 5 Claims

1. A fine amorphous metallurgical powder suitable for compacting and sintering into densified articles consisting essentially of a major portion by weight of a metal selected from the group consisting of transition metals or mixtures thereof and less than a minor amount of an additional component for enhancing the amorphous characteristics of said fine amorphous metallurgical powder, said fine amorphous metallurgical powder further consisting essentially of smooth surfaced plasma densified particles being solidifed from molten particles rebounding from a repellanht surface wherein at least 80 percent of the particles have a size of less than about ten micrometers.

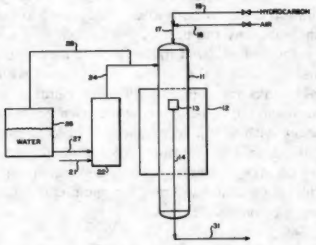


4,613,372

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Randall A. Porter, and Larry E. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum, Bartlesville, Okla.

Division of Ser. No. 693,436, Jan. 22, 1985, Pat. No. 4,552,643.
This application Aug. 21, 1985, Ser. No. 768,005
Int. Cl.[4] C09D *5/10;* C10G *9/12*
U.S. Cl. 106—1.13 12 Claims



1. An antifoulant composition selected from the group consisting of a combination of tin and copper, a combination of antimony and copper and a combination of tin, antimony and copper in elemental form or as organic or inorganic compounds.

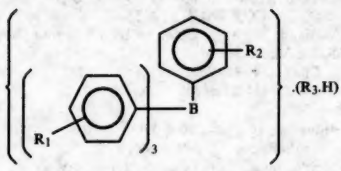
4,613,373

TETRAARYLBORON-AMMONIUM COMPLEXES AND THEIR USES

Masayuki Umeno, Chigasaki; Akitomo Wakabayashi, Atsugi; Kazuo Tomozane, Isehara; Sumio Wakabayashi, Atsugi; Hitoshi Okamoto, Tamano, and Junji Yokoi, Ikoma, all of Japan, assignors to Hokko Chemical Industry Co., Ltd.; Mitsui Engineering & Shipbuilding Co., Ltd. and Nippon Paint Co., Ltd., all of Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 694,064
Claims priority, application Japan, Jan. 24, 1984, 59-9516; May 24, 1984, 59-103644
Int. Cl.[4] C09D *5/14, 5/16;* C07F *5/02;* A01N *99/14*
U.S. Cl. 106—18.3 5 Claims

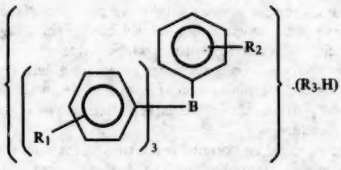
1. A tetraarylboron-ammonium complex having the formula (I):



(I)

wherein R_1 represents a hydrogen or a halogen atom or a lower alkyl group; R_2 represents a halogen atom or a lower alkyl or a lower alkenyl group; and R_3 represents a five- or 6-membered nitrogen-containing heterocyclic ring selected from pyridine, imidazole, and methylimidazole.

4. An antifouling paint comprising as active ingredient a tetraarylboron-ammonium complex having the formula (I):



(I)

wherein R_1 represents a hydrogen atom, a halogen atom or a lower alkyl group; R_2 represents a halogen atom, a lower alkyl group or a lower alkenyl group; and R_3 represents a five- or 6-membered nitrogen-containing heterocyclic ring selected from pyridine, imidazole and methylimidazole in admixture with a paint base composition.

4,613,374
POZZOLANICALLY STABILIZED COMPOSITIONS HAVING IMPROVED PERMEABILITY COEFFICIENTS

Charles L. Smith, Conshohocken, Pa., assignor to Conversion Systems, Inc., Horsham, Pa.

Filed Feb. 21, 1985, Ser. No. 703,725
Int. Cl.[4] C04B 7/34
U.S. Cl. 106—118 **21 Claims**

1. A process for the production of a hardenable mass having low permeability characteristics which comprises providing a slurry produced from the scrubbing of sulfur oxide-containing gases with an alkaline earth metal compound, said slurry comprising an aqueous suspension of alkaline earth metal sulfites, mixing said slurry with a pozzolanically active waste material and an alkaline earth metal in the form of an alkaline earth metal hydroxide or a hydratable alkaline earth metal oxide in amounts so as to provide an overall composition including greater than about 3.5 weight percent alkaline earth metal oxide or hydroxide, said amount being based on the equivalent amount of alkaline earth metal oxide, on a dry weight and additive basis, and wherein the ratio of said pozzolanically active waste material to said slurry, calculated on a dry weight basis, is from about 0.5 to 1 to about 3.0 to 1, and continuing the mixing of said overall composition for a period of time sufficient to provide a degree of mixing at least equivalent to about thirty seconds in a Hobart planetary mixer at first speed, whereby said overall composition is mixed to a degree at least approaching the thixotropic state for said overall composition.

10. A hardenable mass comprising an aqueous suspension of from about 55 to 90 weight percent solids, said solids consisting essentially of greater than about 3.5 weight percent alkaline earth metal oxide or hydroxide, said amount being based on the equivalent amount of alkaline earth metal oxide, on a dry weight and additive basis, from about 33 to 75 weight percent pozzolanically active material, and from about 25 to 67 weight percent alkaline earth metal sulfite and alkaline earth metal sulfate, said hardenable mass being capable of providing a permeability coefficient of less than about 1×10^{-7} cm/sec based upon curing for 28 days at 23° C.

4,613,375
CARBON PASTE AND PROCESS FOR ITS MANUFACTURE

Ludwig Förster, Bad Säckingen; Alois Franke, Rheinfelden, and Reinhard Nobel, Wehr, all of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 4, 1985, Ser. No. 707,857
Claims priority, application Switzerland, Mar. 7, 1984, 1129/84
Int. Cl.[4] C08L 95/00
U.S. Cl. 106—281 R **13 Claims**

1. Carbon paste which comprises a solid carbonaceous component and a binder component, wherein the bindercomponent contains 70–90 weight percent hard bitumen having a softening point of about 80°–110° C. and 10–30 weight percent soft bitumen having a softening point of about 40°–65° C., to provide a non-hazardous product characterized by high electrical conductivity and high thermal stability.

4,613,376
ASPHALT SURFACING MASS

Nils-Olov Nilsson, Lerum; Ingmar Andersson, Gothenburg; Ulrik Sandberg, Skövde, and Eils Karlsson, Axvall, all of Sweden, assignors to Laxa Bruk AB, Sweden

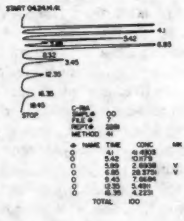
Continuation of Ser. No. 330,698, Dec. 14, 1981, abandoned. This application Aug. 12, 1985, Ser. No. 765,165
Int. Cl.[4] C08L 95/00
U.S. Cl. 106—282 **7 Claims**

1. A surfacing mass for streets, roads, parking places and the like having a draining activity comprising a mixture of a stone material, asphalt, and about 0.5 to 20% by weight of fibers having an average fiber diameter of about 1 and 5 μm, said fibers being pretreated with a cationic tenside wetting agent and said stone material comprising a course portion of material and a small portion of fine material in proportions that provide a surfacing mass having communicating cavities for draining, whereby the stone material mainly comprises stone particles having an average diameter of between 2 and 12 mm and in which about 50% of the stone material has an average particle size of between 8 and 12 mm.

4,613,377
PRODUCTION OF FRUCTOSE SYRUP

Hiroshi Yamazaki, 22 Alderbrook Dr., Nepean, Ontario K2H 5W5, and Kouchi Matsumoto, 260 Cummings Ave. #3, Ottawa, Ontario, both of Canada

Filed Nov. 23, 1984, Ser. No. 674,136
Claims priority, application Canada, Jul. 24, 1984, 459547
Int. Cl.[4] C13D 3/14
U.S. Cl. 127—39 **19 Claims**



1. A process for the preparation of syrups containing fructooligosaccharides by the hydrolysis of inulin which process comprises the steps of:

(a) providing an aqueous solution containing inulin;
(b) passing warm said aqueous solution at a temperature of about 40° C. to about 70° C. through a column containing a strong acid cation-exchange resin, thereby providing an effluent having a pH of about 2.0–about 3.0;
(c) hydrolyzing said effluent by heating at a temperature of about 70° C.–about 100° C.;
(d) passing said hydrolyzate through a column containing a weak base anion-exchange resin, thereby providing an effluent having a pH of about 6.5–about 7.0; and
(e) concentrating said effluent to a syrup containing less water than said effluent.

4,613,378

METHOD OF RESTORING MARBLE AND BRICK SURFACES

Lawrence Christy, 6015 10th Pl., Hyattsville, Md. 20782

Filed Nov. 8, 1984, Ser. No. 669,432
Int. Cl.[4] B08B *3/08*
U.S. Cl. 134—2 3 Claims

1. A method of restoring marble and brick surfaces by removing accumulated dirt, discoloration, and other foreign matter therefrom comprising:
(a) covering the surface to be restored with cheese cloth;
(b) spraying the cheese cloth with a composition containing an aqueous solution of trisodium phosphate, talc and sugar, said trisodium phosphate being employed to loosen the dirt from the surface, the talc being employed to draw the loosened dirt from the surface and the sugar being employed to enhance the flowability of the composition;
(c) covering the coated cheese cloth with a thin plastic cover;
(d) allowing the coating to set on the surface;
(e) removing the thin plastic cover;
(f) removing the composition from the surface by peeling the cheese cloth therefrom; and
(g) rinsing the surface with water or steam.

4,613,379

CLEANING AGENT FOR OPTICAL SURFACES

Kai C. Su; Leslie F. Stebbins, both of Roswell, Ga., and Rajkumar P. Bhatia, Arlington, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 470,181, Feb. 28, 1983, Pat. No. 4,493,783, which is a continuation-in-part of Ser. No. 255,861, Apr. 20, 1981, abandoned. This application Oct. 19, 1984, Ser. No. 662,775
Int. Cl.[4] B08B *11/00, 7/00;* C11D *3/14, 17/08*
U.S. Cl. 134—7 29 Claims

1. A method of cleansing a contact lens comprising rubbing the contact lens with an ophthalmic cleansing composition which comprises an effective amount of particulate polymer for the removal of proteinaceous and lipid deposits on said contact lens, said particulate polymer selected from the group consisting of organic polymers, polysiloxane polymers, and mixtures thereof wherein said polymers have a particle size in the range of from about one micron to about six hundred microns and a Rockwell hardness in the range of from about R120 to about M68, or a Shore hardness in the range from about A15 to about D100, and a carrier in which said particulate polymer is suspended, said carrier having a viscosity sufficient to keep the particulate polymer in suspension.

4,613,380

METHOD FOR REMOVING LIPID DEPOSITS FROM CONTACT LENSES

Jie Chen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 1, 1985, Ser. No. 718,131
Int. Cl.[4] B08B *3/08, 3/10*
U.S. Cl. 134—30 24 Claims

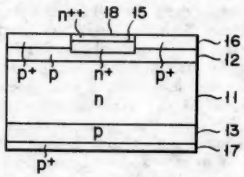
17. A method for removing lipid deposits from tear wettable contact lenses which comprises the steps of:
(A) contacting the surfaces of a contact lens of a polymeric material containing lipid deposits thereon with a cleaning medium comprising a volatile methylsiloxane fluid as the lipid removing agent for a sufficient amount of time to remove a significant portion of the lipid deposits associated with said lens,
(B) rinsing the surfaces of said contact lens with a biocompatible aqueous medium to remove at least a portion of said medium and the lipid deposits associated therewith from the surface of the lens, and
(C) floating the lens convex side down on the surface of a reservoir of an aqueous medium selected from the group consisting of water or isotonic saline solution for up to sixteen hours at room temperature to complete the removal of said cleaning medium from the lens, wherein the concave portion of the lens is kept free of water during this procedure,
wherein the physical and optical properties of the contact lens material remain substantially unchanged after contact with and removal of the methylsiloxane fluid and the contact lens surfaces remain wettable by tears after the methylsiloxane fluid is removed from the contact lens.

4,613,381

METHOD FOR FABRICATING A THYRISTOR

Tsuneo Ogura, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 27, 1984, Ser. No. 644,257
Claims priority, application Japan, Nov. 30, 1983, 58-224075
Int. Cl.[4] H01L *21/225*
U.S. Cl. 148—1.5 4 Claims

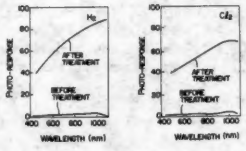


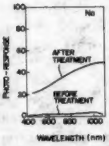
4. A method for fabricating a thyristor comprising the steps of:
(a) diffusing p-type impurities in two surfaces of an n-type silicon substrate to form a p-emitter and a p-base;
(b) selectively diffusing n-type impurities in a surface of a p-base of a pnp wafer having said p-emitter and said p-base to form an n^+-emitter so as not to exceed a surface impurity concentration of $10^{20}/cm^3$;
(c) performing a gettering process by diffusing n-type impurities in two surfaces of a pnpn wafer having said n^+-emitter;
(d) annealing the pnpn wafer subjected to the gettering process in an inert gas at a temperature of 600° to 1,000° C. for up to 10 hours; and
(e) diffusing a heavy metal to control a carrier lifetime in the pnpn wafer subjected to said gettering process.

4,613,382
METHOD OF FORMING PASSIVATED POLYCRYSTALLINE SEMICONDUCTORS

Yoshifumi Katayama, Tokorozawa; Toshikazu Shimada, Tokyo, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 361,382, Mar. 24, 1982, abandoned.
This application Mar. 14, 1985, Ser. No. 710,953
Claims priority, application Japan, Mar. 30, 1981, 56-45553
Int. Cl.[4] H01L *21/223, 21/322*
U.S. Cl. 148—1.5 16 Claims





1. A method of forming a semiconductor body, for use in forming at least one semiconductor active device therein, said semiconductor body comprising a polycrystalline semiconductor film on a substrate, comprising the steps of:

(a) introducing at least one first element selected from the group consisting of fluorine, chlorine, bromine, and iodine into a polycrystalline semiconductor film having dangling bonds at the grain boundaries thereof; and

(b) introducing at least one second element selected from the group consisting of hydrogen and lithium into said polycrystalline semiconductor film having said dangling bonds;

each of at least one first element and each of the at least one second element being introduced in respective amounts of 100 ppm to 10% by atomic ratio, with the total amount of all of the first and second elements introduced being up to 40% by atomic ratio, whereby, due to introduction of approximately equal ambinets of both the first and second elements, the mobilities of both the n-type and p-type carriers in the polycrystalline semiconductor film are improved.

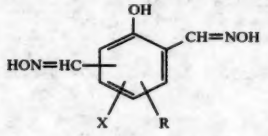
4,613,383
Patent Not Issued For This Number

4,613,384
CORROSION INHIBITOR

Glyn R. John, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 16, 1985, Ser. No. 788,208
Claims priority, application United Kingdom, Oct. 16, 1984, 8426103
Int. Cl.[4] C23C *22/00*
U.S. Cl. 148—6.14 R 7 Claims

1. A process for the inhibition of the corrosion of metals which comprises treating the metal with an optionally substituted 2-6bis(oximinomethyl)-4-alkyl phenols of formula (I)

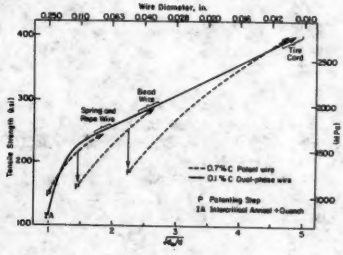


wherein R is an alkyl substituent containing from 7 to 13 carbon atoms and X is hydrogen or an optional substituent.

4,613,385
HIGH STRENGTH, LOW CARBON, DUAL PHASE STEEL RODS AND WIRES AND PROCESS FOR MAKING SAME

Gareth Thomas, Berkeley, and Alvin H. Nakagawa, Campbell, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

PCT No. PCT/US84/01722, § 371 Date Aug. 6, 1984, § 102(e) Date Aug. 6, 1984
PCT Filed Dec. 9, 1982, Ser. No. 638,130
Int. Cl.[4] C21D *9/52*
U.S. Cl. 148—12 B 14 Claims



1. A process for making high strength, high ductility steel wire and rods comprising the steps of:

heating a steel composition consisting essentially of iron, from about 0.05 to 0.15 wt. % carbon, and from about 1.0 to 3.0 wt. % silicon to a temperature T_1 for a period of time sufficient to substantially completely austenitized said steel;

quenching the resulting austenitized steel composition to transform said austenite to 100% martensite;

heating the resulting martensitic steel composition to a temperature T_2 in the two phase $\alpha+\gamma$ range for a period of time sufficient to transform said martensitic steel composition to a volume ratio of ferrite and austenite such that subsequent quenching results in a microstructure having about 10 to 40 volume percent martensite and about 60 to 90 volume percent ferrite;

quenching the resulting ferrite-autenite steel composition to transform the austenite to martensite; and

cold drawing the resulting steel composition, said steel composition characterized by a duplex ferrite-martensite microstructure having about 10 to 40 volume percent martensite and about 60 to 90 volume percent ferrite, said microstructure imparting to said steel composition cold formability properties permitting said steel composition to be cold drawn to a diameter representing up to about a 99.9% reduction in cross-sectional area and imparting to the resulting cold drawn steel product tensile strength properties of up to 400 ksi.

4,613,386
METHOD OF MAKING CORROSION RESISTANT MAGNESIUM AND ALUMINUM OXYALLOYS

Ronald L. Yates, and Patrick L. Hagans, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1984, Ser. No. 574,212
Int. Cl.⁴ C22C *32/00*
U.S. Cl. 148—13 **43 Claims**

1. A method for forming oxalloys of magnesium containing materials or aluminum containing materials comprising:

contacting an alloying material with magnesium containing materials or aluminum containing materials;

irradiating the contacted materials with a beam of high energy radiation in the presence of oxygen; wherein the irradiation is of sufficient energy to form an oxalloy of at least magnesium or aluminum and at least one alloying material; and

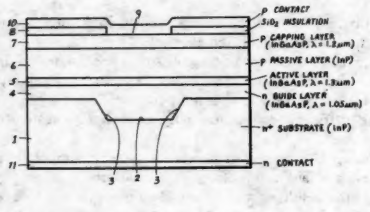
exposing at least a portion of the contacted materials to the beam of high energy radiation for a time sufficient to form the oxalloy;

wherein the alloying material is one or more materials selected from the group consisting of B, Al, Si, Ti, V, Mn, Fe, Co, Ni, Cu, Zn, Ge, As, Zr, Nb, Mo, Ru, Rh, Pd, Ag, Cd, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, Tl, Pb, Bi, Th, rare earths, oxide containing salts thereof, alloys thereof, and mixtures thereof.

4,613,387
INJECTION LASER MANUFACTURE

Stephen E. H. Turley, Harlow, England, assignor to ITT Industries Inc., New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,758
Int. Cl.⁴ H01L *21/208*
U.S. Cl. 148—171 **3 Claims**



1. In a method of producing an inverted rib waveguide laser including an InP substrate having a (100) surface and an (In,Ga)(As,P) active layer, the improvement comprising the steps of

forming at the (100) surface of the substrate a channel extending in the [011] direction by an etching process producing side walls of the channel that differ from A-planes;

epitaxially growing an intermediate layer of an (In,Ga)(As,P) material with a band gap larger than that of the active layer by liquid phase epitaxy in the channel and on the (100) surface of the substrate to thereby form a rib filling the channel and providing a measure of dielectric waveguiding effect for the laser in the lateral directions, with the growth within and at the region substantially juxtaposed with the channel being accelerated relative to that on the (100) surface of the substrate due to the crystallographic orientations of the side walls so that that surface of the intermediate layer that is remote from and faces away from the substrate becomes substantially flat even when the thickness of the intermediate layer outside said region is still relatively small; and

providing the active layer on the substantially flat remote surface of the intermediate layer by liquid phase epitaxy.

4,613,388
SUPERPLASTIC ALLOYS FORMED BY ELECTRODEPOSITION

Robert J. Walter, Thousand Oaks, and Harold E. Marker, Northridge, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 17, 1982, Ser. No. 419,273
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.⁴ C22C *19/07*
U.S. Cl. 148—425 **44 Claims**

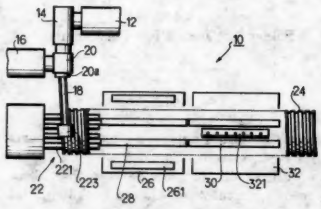
1. A process for the formation of a superplastic alloy which comprises electrodepositing onto a cathode an alloy from an acidic electrolyte solution substantially free of impurities and anions that increase grain-size or form integranular embrittling films and comprising a first metal ion selected from the group consisting of Fe^{++}, Ni^{++} and Co^{++}, at least one second constituent different from the first metal ion and selected from ions of the metals iron, nickel, cobalt, tungsten and molybdenum and colloidal dispersoids selected from the group consisting of free metal powders, metal oxides and metal carbides and at least one anion to form a superplastic, fine-grain metal deposit which exhibits grain boundary flow at a superplastic temperature below a recrystallization temperature of the deposit.

37. A superplastic alloy formed in accordance with the process of claim 1.

4,613,389
PROCESS FOR THE MANUFACTURE OF FLEXIBLE TUBES

Kenichi Tanaka, Tokyo, Japan, assignor to Kakuichi Technical Development Service Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,892
Claims priority, application Japan, Apr. 2, 1985, 60-68418
Int. Cl.⁴ F16L *11/08*; B31C *1/00*
U.S. Cl. 156—143 **7 Claims**



1. A process for the manufacture of flexible tubes, which comprises steps of transferring and forming an unvulcanized

kneaded rubber composition into a rubber strip, while raising-up a temperature of the rubber composition to a vulcanizing temperature range thereof, extruding two hard resin strips, each having a complementary configuration, adjoining said resin strips to each lateral side of said rubber strip to form a three-layered composite web, feeding said composite web to a tube former and helically winding same thereon to cause mutual contact and bond at a lateral end portion in the resin strips of each turn to that of a preceding turn, supporting the resulting tubular body on rotary transferring rollers to pass the tubular body through a heating chamber to make a vulcanization of semi-vulcanized rubber part in said tubular body complete.

4,613,390

METHOD AND APPARATUS FOR MANUFACTURING A HEATER

Martti Mela, Oulun Yliopisto, Biofysiikan laitos, Linnamaa, 90570 Oulu, Finland

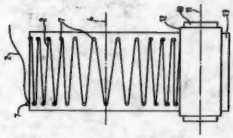
PCT No. PCT/FI84/00034, § 371 Date Jan. 4, 1985, § 102(e) Date Jan. 4, 1985, PCT Pub. No. WO84/04647, PCT Pub. Date Nov. 22, 1984

PCT Filed May 11, 1984, Ser. No. 694,403

Claims priority, application Finland, May 11, 1983, 831653

Int. Cl.[4] H06B *3/00*

U.S. Cl. 156—177 7 Claims



1. A method of manufacturing an article comprising a plastic layer and an electric resistance wire in said plastic layer, said method comprising the steps of:

continuously winding said wire into sequential segments;

holding said wire in said sequential segments;

heating individual wire segments in sequence by conducting electric current through each wire segment individually; and

embedding each individually heated wire segment into said plastic layer by pressing said heated wire segment and a portion of said plastic layer between opposing pressing surfaces.

4. An apparatus for manufacturing an article comprising a plastic layer and an electric resistance wire in said plastic layer, said apparatus comprising:

a rotatable drum having a plurality of spaced apart pin means projecting from said drum for holding the wire in a wound condition on said drum, said wound condition resulting from said wire being continuously wound into sequential segments from one pin means to another pin means as said drum rotates;

a roll pressing against the drum;

means for feeding the plastic layer between the drum and the roll;

means for rotating said drum, whereby said wound wire is moved along a feed path to said roll; and

means at a location along said feed path for passing electric current through individual wire segments in sequence as said drum rotates, whereby said wire segments become individually heated.

4,613,391

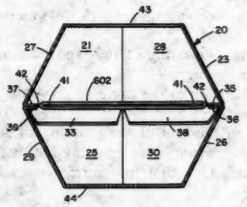
POLYHEDRON ASSEMBLING MACHINE AND METHOD

Robert M. Herlin, Jupiter, Fla., and Richard W. Sutton, Lyme, Conn., assignors to Graphics 3 Inc., Jupiter, Fla.

Filed Sep. 20, 1984, Ser. No. 652,469

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—213 35 Claims



33. A method of making a collapsible polyhedron comprising the steps of:

placing a flat polyhedron blank on a forming fixture having a hinged connection;

pre-bending portions of the polyhedron blank along score lines;

applying adhesive to the polyhedron blank so that one part of the polyhedron blank will be adhesively connected to another part of the polyhedron blank;

conveying a resilient member to a resilient member inserting means;

inserting a resilient member into the polyhedron blank and attaching the resilient member in tension so that the inherent nature of the resilient member to return to its state of equilibrium will serve to bias the polyhedron into its formed configuration; and

folding the polyhedron blank by bending the forming fixture along its hinged connection to form the flat polyhedron blank into its formed polyhedron configuration.

4,613,392

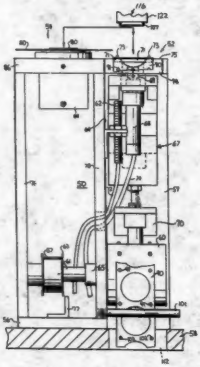
APPARATUS AND METHOD FOR ASSEMBLING A FLEXIBLE RECORDING DISC

Robert H. Klar, Hollis, and Jeffery R. Lord, Wells, both of Me., assignors to Shape Inc., Biddeford, Me.

Filed May 31, 1985, Ser. No. 739,859

Int. Cl.[4] B31F *5/00*

U.S. Cl. 156—235 **15 Claims**



1. A method for assembling a flexible recording disc, comprising the following steps;

(a) providing an A-ring carrier tape including a plurality of adhesive A-rings;

(b) indexing each of the plurality of A-rings to a predetermined position;

(c) stripping the first of the plurality of A-rings from the A-ring carrier tape and applying the first of the plurality of A-rings to a first hub carried by a hub carrier and placement tool;

(d) providing means for receiving a flexible recording disc;

(e) moving the hub carrier and placement tool with the first hub/first A-ring attached thereto to the means for receiving the flexible recording disc; and

(f) adhering the first hub to the flexible recording disc via the first A-ring fixed on the first hub.

8. An apparatus for assembling a flexible recording disc, comprising:

(a) an A-ring carrier tape including a plurality of adhesive A-rings;

(b) means for indexing each of the plurality of A-rings to a predetermined position;

(c) means for stripping and applying a first of the plurality of A-rings to a first hub received on a hub carrier and placement tool;

(d) means for receiving a flexible recording disc; and

(e) means for moving the hub carrier and placement tool to the flexible recording disc to adhere the first hub/first A-ring to the recording disc.

4,613,393

METHOD FOR FORMING REINFORCED THERMOPLASTIC COMPOSITES

James B. Cattanach, Middlesbrough, and Anthony E. Jones, Hitchin, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 25, 1984, Ser. No. 664,691

Claims priority, application United Kingdom, Nov. 7, 1983, 8329664

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—323 **9 Claims**

1. A method of improving the surface finish of a fibre-reinforced thermoplastic article in which the fibres are present as superimposed layers of continuous, aligned fibres comprising pressing the layers at a temperature above the softening point of the thermoplastic of the article characterised in that the pressure is transmitted to the superimposed layers through a resilient member and that a metal foil having a thickness of between 0.05 and 0.5 mm is present between the resilient member and the reinforced article to be pressed, said metal foil being a smoothing means enabling the smoothing of the surface of said thermoplastic article contacting said metal foil and said foil not being a permanent part of said thermoplastic article.

4,613,394

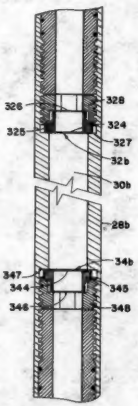
STAGED CHEMICAL PIPE CUTTER

Jamie B. Terrell, Fort Worth, Tex., and Benny J. Holmes, Broussard, La., assignors to Gearhart Industries, Inc., Fort Worth, Tex.

Continuation of Ser. No. 183,178, Sep. 2, 1980, abandoned. This application Mar. 14, 1984, Ser. No. 589,561

Int. Cl.[4] E21B *29/00*

U.S. Cl. 156—345 **3 Claims**



1. A tool for cutting metal by expelling a stream of liquid chemical cutting reactant into forceful flowing contact with a designated area of said metal comprising:

a first mass of said reactant housed within said tool and sealed therein by a first and second rupture diaphragm, each of said rupture diaphragms including a first and second rupture membrane and an air space disposed between said rupture membranes;

means for applying a force to said first rupture diaphragm sufficient to breach said first rupture diaphragm and sufficient to cause said first mass to breach said second rupture diaphragm;

a heating medium adapted to pass said first mass therethrough for heating said first mass to a substantially elevated temperature; and

means for directing the flow of said first mass as heated

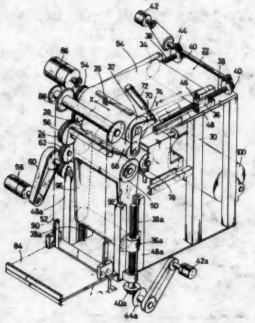
through at least one orifice into flowing contact with said metal.

4,613,395

APPARATUS FOR BONDING A PRINTING PLATE ON A BASE FILM

Kazumi Hasegawa, Aichi, Japan, assignor to Isowa Industry Company, Ltd., Aichi, Japan

Filed Aug. 6, 1984, Ser. No. 637,823
Claims priority, application Japan, Aug. 6, 1983, 58-144021
Int. Cl.[4] G01B *11/00*
U.S. Cl. 156—378 **8 Claims**



1. Apparatus for bonding a printing plate upon a base film, comprising:

first means for supporting a strip of paper thereon;

second means for supporting a base film thereon;

means operatively associated with said first supporting means for transporting said strip of paper in a first direction;

plotter means disposed above said first supporting means and movable in a second direction perpendicular to said first direction of movement of said strip of paper for marking said strip of paper at a predetermined location upon said strip of paper; and

a half mirror interposed between said first and second supporting means, and said strip of paper and base film respectively supported thereon, for projecting an image of said marked location on said strip of paper onto said base film for determining a location upon said base film, corresponding to said marked location of said strip of paper, at which a printing plate can be secured.

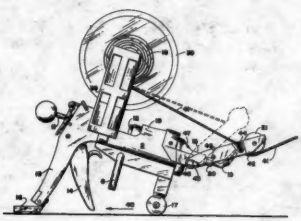
4,613,396

PROCESS AND APPARATUS FOR JOINING CARPETING

Jimmy M. Scarborough, 1625 Minerva Ave., Jacksonville, Fla. 32207

Filed Mar. 14, 1984, Ser. No. 589,329
Int. Cl.[4] B32B *35/00*; B65H *69/06*
U.S. Cl. 156—391 **21 Claims**

1. An apparatus for joining two pieces of carpet abutting along a juncture line, each piece of carpet having a backing which faces upwardly, the apparatus comprising hot glue dispensing means in a housing having a nozzle for dispensing hot molten glue, a manually operable valve means connected to said nozzle for selectively releasing a hot molten glue through said nozzle, means for supporting a roll of uncoated joining tape on said housing to dispense uncoated tape to a position rearwardly of said nozzle, said tape being sufficiently wide to extend laterally over a portion of both pieces of carpet adjacent the juncture line, a glue applicator attached to said nozzle, said applicator having a hollow inlet operatively connected to said nozzle, said hollow inlet communicating with a broad, thin channel outlet means having gnerally the same width as that of the tape and adapted to deposit a strip of molten glue to the backing of each piece of carpet such that the total width of the glue strip is substantially the same as the width of said tape, and tape pressing means attached to said



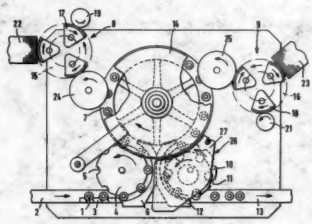
housing rearwardly of said applicator for pressing the tape onto the unspread deposited strip of molten glue and to cause the strip of molten glue to penetrate into the backing without any substantial contact between said glue strp and said tape pressing means.

4,613,397

EQUIPMENT FOR APPLYING A BLANK OF FOIL TO BOTTLES

Rainer Buchholz, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,447
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345226
Int. Cl.[4] B65C *3/22, 9/02*
U.S. Cl. 156—476 **23 Claims**



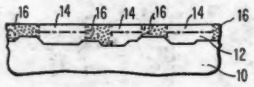
1. In an apparatus for applying a blank of foil to bottles and that includes a turntable with a plurality of separately controlled devices around its circumference for rotating the bottles, at least one labeling station for transferring the foil blanks to the bottles once the rotation devices have positioned the bottles at a specific angle, an application device that presses the blanks onto the bottles, a rotating output transport star that has accommodations for the bottles and is positioned downstream of the turntable and upstream of a conveyor belt that carries the bottles away, and a supporting stand that is positioned in the vicinity of the output transport star and has a rotating transfer-and-application device comprising a plurality of similar units distributed around its circumference with pressure-application elements that fold and press down the ends of the blank extending beyond the head of each bottle, the improvement which comprises positioning the pressure-application elements so that as they revolve they are kept outside the circumference of the circle defined by the devices on the turntable that accommodate the bottles.

4,613,398

FORMATION OF ETCH-RESISTANT RESISTS THROUGH PREFERENTIAL PERMEATION

Kaolin N. Chiong, Pleasantville; Bea-Jane L. Yang, and Jer-Ming Yang, both of Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1985, Ser. No. 741,779
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*
U.S. Cl. 156—628 30 Claims



1. A method of creating etch-resistant polymeric films for use in the production of micron and submicron dimension patterns and fine lines, comprising:

(a) applying a layer of polymeric resist material to a substrate;

(b) exposing said layer of polymeric resist material to at least one kind of patterned radiation capable of altering the permeability of said polymeric resist material; and

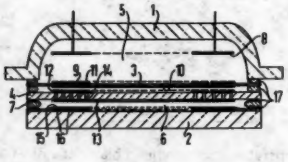
(c) preferentially permeating/diffusing an organometallic material into the surface of said polymeric resist material, to provide each resistance within the portion of said polymeric resist material within which significant permeation of said organometallic material occurs.

4,613,399

METHOD FOR MANUFACTURING A DISPLAY DEVICE

Manfred Kobale, Faistenhaar; Günter Trausch, and Rolf Wengert, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,374
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341397
Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—634 13 Claims



1. A method for manufacturing a display device containing at least two mutually parallel plates which are connected tightly at the edges via a frame, and at least one parallel plate coated with a pattern of separately addressable electrodes with each electrode brought through the frame to the outside of the frame, which comprises:

(1a) applying a metallic adhesion layer <0.1 μm thick to the plate to be coated by a vacuum techniques,

(b) applying a metallic conductor layer <1 μm thick to the adhesion layer by a vacuum technique,

(c) covering with a first mask at least the adhesion and conducting layer zone outside the electrode pattern which outside layer zone is designated resisdual zone,

(1c') also covering with the first mask, the electrode pattern in the region provided for the frame designated feed-through region,

(2a) reinforcing the conducting layer in its region left free by the first mask, by applying by electroplating at least one layer, in which the topmost layer of the reinforcement is >1 μm thick and consists of nickel,

(b) removing the first mask

(2c) covering the feedthrough region with a second mask,

(3a) etching off the adhesion layer and the conducting layer in the residual zone,

(3b) removing the second mask, and

(4a) placing one of the plates in the frame,

(4a') wherein the frame is a glass solder,

(b) placing the other plate above the plate in the frame,

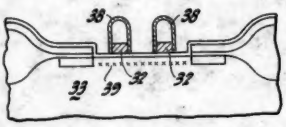
(c) connecting both plates to each other at an elevated temperature.

4,613,400

IN-SITU PHOTORESIST CAPPING PROCESS FOR PLASMA ETCHING

Simon W. Tam, San Francisco; Ronald P. Reade, Palo Alto; Jerry Y. K. Wong, Union City, and David N. Wang, Cupertino, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed May 20, 1985, Ser. No. 736,435
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00*; B05D *3/06*
U.S. Cl. 156—643 20 Claims



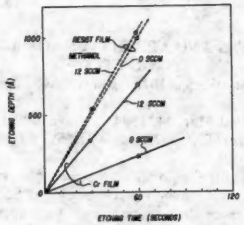
2. A method for conditioning an organic mask to increase the resistance of the mask to the etching of an underlying silicon-containing layer, comprising: exposing the mask to a plasma containing a silicon-etching species for forming a silicon-containing coating on the mask; and exposing the coating to an oxidizing plasma containing a silicon-etching species for selectively oxidizing the coating.

4,613,401

METHOD FOR DRY ETCHING A CHROMIUM OR CHROMIUM OXIDE FILM

Eiichi Hoshino, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1985, Ser. No. 767,575
Claims priority, application Japan, Aug. 24, 1984, 59-175070
Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 8 Claims



1. An improved method for dry etching a chromium (Cr) or Cr-oxide film in which an etchant gas is used to remove the Cr or Cr-oxide film by chemically reacting said film with the etchant gas, the improvement comprising:

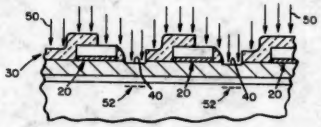
subjecting the Cr or Cr-oxide film to a plasma of a gas mixture containing the vapors of a halide of a hydrocarbon and the vapors of an alcohol selected from a group consisting of CH_3OH and C_2H_5OH.

4,613,402

METHOD OF MAKING EDGE-ALIGNED IMPLANTS AND ELECTRODES THEREFOR

David L. Losee, Fairport, and James P. Lavine, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,204
Int. Cl.[4] H01L 21/306; B44C 1/22; C03C 15/00; C23F 1/02
U.S. Cl. 156—643 12 Claims



1. A method for accurately aligning strips of implanted dopant in a semiconductor substrate with conductive strips above the implant strips, comprising the steps of

(a) depositing a layer of conductive material above said semiconductor substrate;

(b) forming a patterned mask above said layer, the pattern exposing spaced-apart first strip portions of said conductive layer;

(c) ion-implanting said dopant strips into said substrate through the conductive layer strip portions exposed by said patterned mask;

(d) removing a portion of said mask but retaining the rest so as to expose said conductive layer over first portions of said substrate that contain an implanted dopant strip and over portions of said substrate adjacent to said first portions;

(e) forming on said conductive layer between said retained mask portions, second strips of a material or of a thickness effective, when carrying out steps f) and (g), to leave behind said second strips;

(f) removing said retained mask portions; and

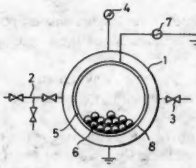
(g) etching away said conductive layer where the latter is not covered with said second strips.

4,613,403

METHOD FOR TREATING GOLF BALL SURFACE WITH GLOW DISCHARGE PLASMA AND APPARATUS THEREFOR

Tomio Oyachi, Akikawa; Minoru Takahashi, Kawasaki; Koichi Izuhara, Yokohama; Setsuo Akiyama, Higashi Murayama, and Masato Yoshikawa, Tokyo, all of Japan, assignors to Bridgestone Corp., Tokyo, Japan

Filed Jun. 13, 1985, Ser. No. 744,439
Claims priority, application Japan, Aug. 13, 1984, 59-167934
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06; B29C 17/08
U.S. Cl. 156—643 13 Claims



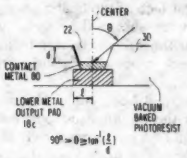
1. Method for treating golf ball surface characterized by subjecting uncoated ball to unpolymerizable gas plasma.

4,613,404

MATERIALS WHICH EXHIBIT A SURFACE ACTIVE EFFECT WITH VACUUM BAKED PHOTORESISTS AND METHOD OF USING THE SAME

Masatoshi Tabei, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1984, Ser. No. 672,326
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 9 Claims



1. In a process for manufacturing a thin film magnetic head, the improvement wherein a metal, alloy or mixture thereof which improves the surface characteristics of a vacuum baked photoresist is deposited on the vacuum baked photoresist to thereby improve adhesion of a subsequently deposited layer.

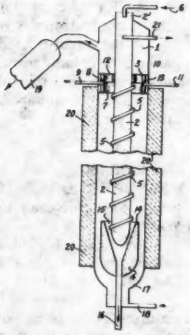
6. The process as claimed in claim 1, wherein, prior to the deposition of the metal, metal alloy or mixture thereof, holes are etched in the vacuum baked photoresist, whereafter the metal, metal alloy or mixture thereof is deposited on the surface of the vacuum baked photoresist and in said holes, whereafter the metal, metal alloy or mixture thereof is removed by deep angle milling, whereby the metal, metal alloy or mixture thereof is permitted to remain in said etched holes.

4,613,405

APPARATUS TO CONCENTRATE SOLUTIONS AND TO RECOVER SOLVENTS

Etienne Godbille, Villemonble, France, assignor to Roussel UCLAF, Romainville, France

Continuation of Ser. No. 398,620, Jul. 15, 1982, abandoned. This application Aug. 16, 1984, Ser. No. 641,202
Claims priority, application France, Jul. 17, 1981, 81 13959
Int. Cl.[4] B01D 1/06, 1/22
U.S. Cl. 159—13.3 15 Claims



1. An apparatus to prevent the accumulation of large quantities of solutions by concentrating the solutions at the rate at which they are introduced into the apparatus and recovering solvents continuously comprising means to prevent the accumulation of large quantities of solutions by concentrating the solutions at the rate at which they are introduced into the apparatus including a column equipped with a heating body

placed axially, an inlet for the liquid solution to be treated, a distributor of the introduced solution, an outlet for the liquid treated, an inlet for a flow gas and an outlet for the solvent vapors to be recovered and a heating means insuring the maintenance of the internal temperature of said column, wherein the column comprises,

a heating body containing in its active part a plurality of flow guides,

a distributor of the liquid to be treated which is placed toward the upstream end of the column and which distributes both the liquid to be treated and the rinsing liquid onto the surface of the heating body and which is simultaneously permeable to the solvent vapors and flow gas,

an outlet for the solvent vapors being positioned to receive said solvent vapors after said vapors pass through said distributor;

and a cylindrical body hollowed in a form of sink placed axially in the column and positioned toward the downstream end of the column for effecting simultaneously the flow of the concentrated liquid dropping from the heating body to the outlet from the liquid treated and the introduction of a flow gas into the column through the flow gas inlet.

12. A process to concentrate a solution and to recover a solvent continuously which comprises preventing the accumulation of large quantities of solution by concentrating the solution at a rate at which they are introduced into an apparatus by, introducing a solution as a liquid to be treated in the inlet of the apparatus to concentrate solutions and to recover solvents continuously comprising a column equipped with a heating body placed axially, an inlet for the liquid solution to be treated, a distributor of the introduced solution, an outlet for the liquid treated, an inlet for a flow gas and an outlet for the solvent vapors to be recovered and a heating means insuring the maintenance of the internal temperature of said column, wherein the column comprises,

a heating body containing in its active part a plurality of flow guides,

a distributor of the liquid to be treated which is placed toward the upstream end of the column and which distributes both the liquid to be treated and the rinsing liquid onto the surface of the heating body and which is simultaneously permeable to the solvent vapors and a flow gas,

an outlet for the solvent vapors being positioned to receive said solvent vapors after said vapors pass through said distributor;

and a cylindrical body hollowed in a form of sink placed axially in the column and positioned toward the downstream end of the column for effecting simultaneously the flow of the concentrated liquid dropping from the heating body to the outlet from the liquid treated and the introduction of a flow gas into the column through the flow gas inlet, and continuously recovering the solvent from said solution at the outlet for the solvent vapors and collecting concentrated solution from the sink.

4,613,406

METHOD OF MEASURING DRAINAGE RATE

Jerome M. Gess, Bellevue, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 481,975, Apr. 4, 1983, abandoned. This application Feb. 8, 1985, Ser. No. 699,238

Int. Cl.[4] G01N *7/00, 11/00*

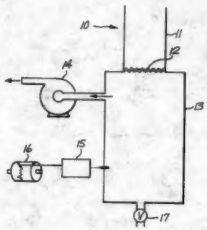
U.S. Cl. 162—49 **2 Claims**

1. In a method of measuring drainage rate of a pulp furnish for making paper products to predict how said furnish will dewater on a paper machine forming wire, the method being of the type wherein a slurry sample of the furnish is placed in a holding container having a screen bottom for separating furnish solids from slurry water, the slurry then being dewatered so as to form a wet pad of furnish solids on the screen with the water draining therethrough, the improvement comprising:

placing a finite sample of slurry in the holding container;

dewatering the slurry sample while subjecting it to a pressure differential created by providing a reduced pressure beneath the holding container screen while the upper surface of the slurry is exposed to the atmosphere;

recording, simultaneously with beginning dewatering the sample, the pressure differential across the sample as a function of time throughout the entire period when water is being removed, particularly recording a first point of inflection where pressure differential decreases as air first



begins to be drawn through the pad on the screen, a second point of inflection marking the point at which pad compression in response to the pressure differential effectively ends, and a third point of inflection marking the point where water is no longer being removed but air continues to be drawn through the pad; and

relating said recorded points of inflection to drainage characteristics of a pulp furnish on a paper machine forming wire.

4,613,407

CATIONIC ADDITIVE FOR THE MANUFACTURE OF PAPER

Michel Huchette; Guy Fleche, both of Merville, and Serge Gosset, Lestrem, all of France, assignors to Roquette Freres, Lestrem, France

Filed Oct. 26, 1984, Ser. No. 665,261

Claims priority, application France, Oct. 27, 1983, 83 17186

Int. Cl.[4] D21H *3/28*

U.S. Cl. 162—175 **13 Claims**

1. Wet-end cationic starch additive for the manufacture of paper comprising a mixture of

between from about 2% to about 98% by weight of the mixture of at least one cationic cereal starch; and

between from about 98% to about 2% by weight of the mixture of at least one cationic tuber starch; said mixture containing an amount of fixed nitrogen greater than about 0.1% based on the dry matter of the starch mixture.

4,613,408

FUEL PRODUCING APPARATUS USING WASTE PRODUCTS

William A. Howard, P.O. Box 400, Estacada, Oreg. 97023

Filed Nov. 23, 1984, Ser. No. 674,305

Int. Cl.[4] C10B *1/00*

U.S. Cl. 202—84 **5 Claims**

1. Apparatus for producing fuel from waste products of the type capable of releasing a flammable oil and gas when heated comprising

a melting pot arranged to receive water products,

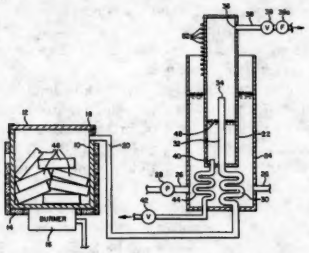
exterior heating means for said pot arranged to melt the waste products,

an outlet at an upper portion of said pot for the discharge of gas resulting from melting the waste products,

a closed float tank communicating with said outlet,

cooling means comprising an open top cooling tank having cooling liquid therein for buoyantly supporting said float tank and for condensing said gas,

and discharge means in said float tank arranged to tap off gases and condensed oil,



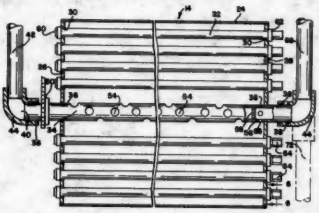
said melting pot and cooling tank being sealed to atmosphere to prevent escape of polluting by-products.

4,613,409

HIGH RATE SOLAR STILL AND PROCESS

Craig S. Volland, 5615 Kenwood, Kansas City, Mo. 64110

Filed Aug. 19, 1985, Ser. No. 766,648
Int. Cl.[4] C02F *1/14*
U.S. Cl. 203—10 **14 Claims**



1. A solar still apparatus, comprising:

(a) an elongated salt gradient solar pond defining a heat storage section containing a hot liquid;

(b) an evaporator module supported within said solar pond for rotation about a substantially horizontal axis and submerged within said heat storage section thereof, comprising:

(i) an elongated cylindrical housing sealed off by an influent end plate and an effluent end plate;

(ii) a plurality of spaced apart substantially horizontal open ended heat transfer tubes positioned within said housing having influent and effluent end sections thereof respectively extending through said influent end plate and said effluent end plate for passage of hot liquid from said solar pond therethrough;

(iii) a substantially hollow distribution shaft positioned within said housing having end sections thereof respectively extending through said influent end plate and said effluent end plate;

(iv) said distribution shaft having a plurality of spaced apart openings formed therein; and

(v) said effluent end section of said distribution shaft being closed off by a wall;

(c) influent conduit means for directing feedwater into said distribution shaft for distribution of same through said openings in said shaft into said housing;

(d) means for rotation of said evaporator module about a substantially horizontal axis so as to cause the feedwater to fall through said housing into heat transferring contact with said heat transfer tubes and thereby vaporize a portion of the feedwater;

(e) means for withdrawing the vapor formed in said evaporator module; and

(f) means for condensing the vapor withdrawn from said evaporator module.

14. A method of purifying raw feedwater, comprising:

(a) directing raw feedwater into an evaporator module submerged in a body of heated liquid, said evaporator module having a sealed housing through which a plurality of spaced apart substantially horizontal open ended heat transfer tubes extend;

(b) directing heating liquid from said body of heating liquid through said heat transfer tubes;

(c) rotating said evaporator module about a substantially horizontal axis;

(d) distributing raw feedwater within said evaporator module so as to cause the feedwater to descend into heat transferring contact with said heat transfer tubes and thereby vaporize a portion of the feedwater;

(e) withdrawing vapor formed in the evaporator module; and

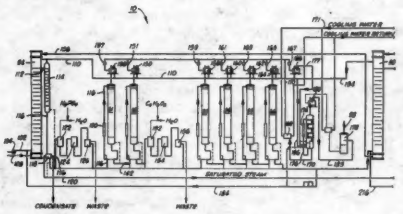
(f) condensing the vapor withdrawn from the evaporator module.

4,613,410

METHODS FOR DYNAMICALLY REFINING AND DEODORIZING FATS AND OILS

Jacob B. Rivers, Jr., 2801 NW. Expressway, Suite 125, Oklahoma City, Okla. 73112

Filed Oct. 7, 1983, Ser. No. 540,037
Int. Cl.[4] B01D *1/16, 3/10;* C09F *5/12*
U.S. Cl. 203—39 **11 Claims**



1. A method of distilling a distillation product from raw edible oil, comprising the steps of:

forming from a relatively narrow, elongated nozzle a sheet of liquid edible oil having a relatively narrow thickness and a relatively large surface area;

downwardly driving at from approximately 1 to 50 meters per second said sheet of liquid edible oil in a distillation column at distillation temperature and pressure such that a distillation vapor product is formed therefrom, said downward driving of said sheet resulting from a relatively high pressure drop of said liquid edible oil as it passes from said nozzle in said forming of said sheet;

forming a relatively low pressure at the top of said distillation column directly above and in line with said nozzle such that said vapor product is driven rapidly upwardly and such that the surface of said downwardly driven sheet of oil moves rapidly with respect to vapor in said distillation column to promote distillation; and

removing said vapor product from the top of said distilation column above said nozzle.

4,613,411

PROCESS FOR THE PRODUCTION AND PURIFICATION OF DIETHOXYMETHANE BY AZEOTROPIC DISTILLATION

Chao-Yang Hsu, Media, and Paul E. Ellis, Jr., Downingtown, both of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 621,815, Jun. 18, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 803,199

Int. Cl.[4] B01D *3/36*; C07C *41/58*

U.S. Cl. 203—67 5 Claims

1. In a process for the product of diethoxymethane by reacting formaldehyde with ethanol in the presence of an acidic catalyst, the improvement comprising recovering an ethanol/-diethoxymethane azeotrope from the reaction production mixture by distillation, adding an agent to the recovered azeotrope which will form an azeotrope with the ethanol, and removing the agent/ethanol-azeotrope by a second distillation, thereby providing substantially pure diethoxymethane.

4,613,412

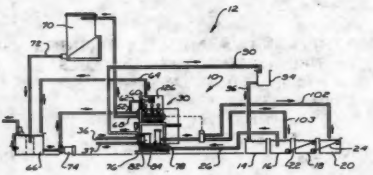
EVACUATOR SYSTEM AND PROCESS FOR AN EVAPORATIVE RECOVERY SYSTEM

John T. MacDermid, Plymouth, Conn., assignor to Wastesaver Corporation, Plymouth, Conn.

Filed Nov. 26, 1984, Ser. No. 674,553

Int. Cl.[4] B01D *3/10*

U.S. Cl. 203—91 9 Claims



1. An automatic evacuator system for transferring liquids in an evaporative recovery system of a type which employs an evaporator unit including an evaporator chamber with separate concentrate and distillate regions and a supply inlet to receive a source material and heating and condensing means to form a concentrate and a distillate from said material by an evaporative process which includes forming a partial vacuum within said chamber and heating the material to a temperature to effect evaporation of said material and condensing the evaporated material in said chamber by means of a cooling liquid flowing through a cooling conduit to form a distillate wherein said concentrate and said distillate are generally segregated into separate regions of said chamber comprising:

an eductor system including an eductor in fluid communication with said cooling conduit to produce a partial vacuum source by passing cooling fluid through said eductor;

a source of pressurized air;

a generally fluid tight concentrate container;

a first inlet conduit and a first inlet valve interposed in said first inlet conduit to provide selective fluid communication between said concentrate region and said concentrate container;

a first vacuum conduit and a first vacuum valve interposed in said first vacuum conduit to provide selective fluid communication between said partial vacuum source and said concentrate container;

a first air conduit and a first air valve interposed in said first air conduit to provide selective fluid communication between said source of pressurized air and said concentrate container;

a first outlet conduit in selective fluid communication with said concentrate container;

a generally fluid tight distillate container;

a second inlet conduit and a second inlet valve interposed in said second inlet conduit to provide selective fluid communication between said distillate region and said distillate container;

a second vacuum conduit and a second vacuum valve interposed in said second vacuum conduit to provide selective fluid communication between said partial vacuum source and said distillate container;

a second air conduit and a second air valve interposed in said second air conduit to provide selective fluid communication between said source of pressurized air and second distillate container;

a distillate outlet in selective fluid communication with said distillate container;

control means to automatically control said first and second conduit valves, vacuum valves, and air valves so that concentrate and distillate may be selectively transferred from said evaporator unit to respective concentrate and distillate containers and selectively purged from the containers to respective first and second outlet conduits.

7. In an evaporative recovery system wherein a source material is heated to a temperature under a partial vacuum to effect evaporation of said material to form a concentrate and evaporated material and said evaporated material is condensed by means of a flowing cooling liquid to form a distillate, a method for transferring the concentrate to a concentrate container and the distillate to a container comprising:

a. employing the flowing cooling liquid to produce a partial vacuum source by educting means;

b. providing a first fluid communication path between said distillate and said distillate container;

c. selectively connecting said distillate container to said partial vacuum source to thereby draw distillate into said distillate container;

d. providing second fluid communication path between said concentrate and said concentrate container;

e. selectively connecting said concentrate container to said partial vacuum source to thereby draw concentrate into said concentrate container.

4,613,413

PROCESS FOR PRODUCING ALUMINUM SUPPORT FOR LITHOGRAPHIC PLATE

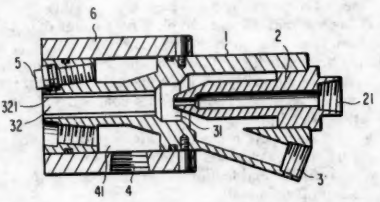
Akio Uesugi; Tsutomu Kakei, and Makoto Takeuchi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 21, 1984, Ser. No. 612,171

Claims priority, application Japan, May 19, 1983, 58-88082

Int. Cl.[4] C25D *11/16*

U.S. Cl. 204—33 16 Claims



1. A process for producing an aluminum support for a lithographic printing plate which comprises jetting a high-pressure liquid from at least one nozzle at a high rate, joining the jetted stream with a slurry containing a fine powder of an abrasive spouted from at least one spout, and directing the resulting mixed stream to strike against a surface of an aluminum plate to carry out cleaning and sandblasting at the same time.

4,613,414
METHOD FOR MAGNESIUM PRODUCTION

Olivo G. Sivilotti, Kingston, Canada, and Junkichi Iseki, Amagasaki, Japan, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 565,905, Dec. 27, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,641

Claims priority, application United Kingdom, Dec. 30, 1982, 8236996

Int. Cl.⁴ C25C *3/04, 7/06*

U.S. Cl. 204—70 **7 Claims**

1. A method of making magnesium by the use of an electrolytic cell including at least one electrode assembly of a cathode and an anode and at least one intermediate bipolar electrode having a cathodic face, said assembly defining substantially vertical interelectrode spaces,

which method comprises providing a chloride-based electrolyte which is more dense than the magnesium and passing an electric current between the anode and the cathode, whereby molten magnesium is produced at the cathodic face of the at least one intermediate bipolar electrode and electrolyte flows over the said cathodic face in an upward direction,

wherein the said cathodic face is provided with a plurality of small cavities which trap droplets of molten magnesium formed thereon during electrolysis.

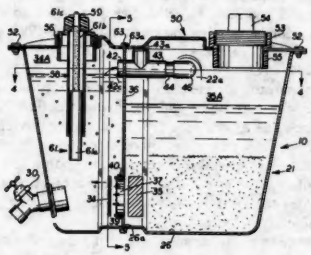
4,613,415
ELECTROLYTIC CHLORINE AND ALKALI GENERATOR FOR SWIMMING POOLS AND METHOD

Clarence F. Wreath, Tarpon Springs, and Robert D. Keller, Jr., Dunedin, both of Fla., assignors to Sophisticated Systems, Inc., Palm Harbor, Fla.

Filed Aug. 17, 1984, Ser. No. 642,183

Int. Cl.⁴ C25B *1/34*

U.S. Cl. 204—98 **27 Claims**



18. A method of adding chlorine and sodium hydroxide to a body of water such as a swimming pool comprising the steps of:

providing an electrolytic cell having an anode chamber and a cathode chamber containing an anode and a cathode, respectively, and having a cation membrane therebetween,

providing an aqueous metallic chloride salt solution in said anode chamber,

providing water in said cathode chamber,

establishing the alkalinity of said body of water between approximately 80 and 150 parts per million of an alkali,

providing a region of lower than atmospheric pressure in communication with said body of water,

providing a vent in said electrolytic cell in communiction with said anode chamber,

generating chlorine gas in said anode chamber and hydrogen gas and sodium hydroxide in said cathode chamber by supplying electricity to said anode and cathode,

forming an opening between the cathode chamber and the anode chamber at a point that is a predetermined distance above the level of the respective solutions therein before said electricity is applied,

collecting overflowing sodium hydroxide in an overflow conduit means,

positioning said overflowing conduit means so that it extends through said opening and into said anode chamber,

providing an outflow conduit means that collects chlorine gas generated in said anode chamber, and

forming from said overflow conduit means and said outflow conduit means a single conduit that delivers only chlorine gas, air and sodium hydroxide to said region from said electrolytic cell.

4,613,416
PROCESS FOR THE CONCENTRATION OF SULFURIC ACID

Heinz Kau, Kriftel, and Jürgen Russow, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,330

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315626

Int. Cl.⁴ C25B *1/20, 1/22*

U.S. Cl. 204—98 **10 Claims**

1. A process for increasing the sulfuric acid concentration of a solution containing an alkali metal sulfate, sulfuric acid and alkaline earth metal ions, by electrolysis in a cell which comprises a plurality of cation exchange membranes which demarcate an anode compartment, a cathode compartment and a center chamber being present between said cathode and anode compartments, in which process the solution, the sulfuric acid concentration of which is to be increased, is introduced into the anode compartment of the cell, the center chamber is filled with a solution containing aqueous alkali metal ions, alkaline earth metal ions migrate from the anode compartment into the center chamber and the concentration of alkaline earth metal ions in the center chamber is kept below 5 mg/l during electrolysis.

4,613,417
SEMICONDUCTOR ETCHING PROCESS

Edward J. Laskowski, Scotch Plains, and Catherine Wolowodiuk, Chatham Township, Morris County, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1984, Ser. No. 687,129

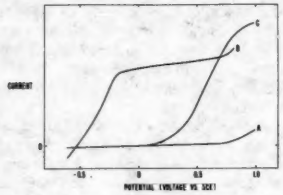
Int. Cl.⁴ C25F *3/12*

U.S. Cl. 204—129.85 **17 Claims**

1. A process for fabricating a device comprising n-type or semi-insulating III–V semiconductor compound comprising aluminum or indium comprising the step of photoelectrochemically etching the III–V semiconductor compound by passing current through the III–V semiconductor compound,

electrolytic solution with electrical conductivity greater than 0.00001 mho/cm and anode in which the photoelectrochemical etching procedure further comprises:

a. applying a potential to the semiconductor which is between the maximum potential of the valence band of the semiconductor in the electrolytic solution and the minimum potential of the conduction band of the semiconductor in the electrolytic solution;



b. illuminating the part of the surface of the semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band;

characterized in that

c. the electrolytic solution comprises nonaqueous solvent with less than 10 weight percent water.

4,613,418

ALUMINIUM REDUCTION CELLS

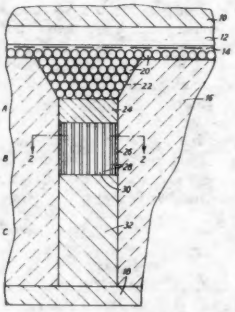
Ernest W. Dewing; Adam J. Gesing; David N. Mitchell, all of Kingston, and Aniket Pant, Inverary, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Nov. 28, 1984, Ser. No. 675,718

Claims priority, application United Kingdom, Nov. 29, 1983, 8331769

Int. Cl.[4] C25C *3/08, 3/16*

U.S. Cl. 204—243 R **11 Claims**



1. An aluminium reduction cell including a potlining and embedded therein at least one cathode current collector, the floor of the cell having at least one depression with one end of the cathode current collector positioned therein, the other end of the collector being connected to the external electricity supply, wherein the or each depression is filled with metal-wettable bodies with interstices adapted, when the cell is in operation, to be filled with molten aluminium and of a size to prevent entry of electrolyte or sludge.

4,613,419

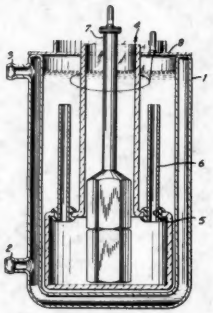
NOVEL GEL ELECTROPHORESIS CELL HAVING A LOWER BUFFER CHAMBER WITH PERFORATED SHOULDER FOR HOLDING GEL TUBES OR CHANNELS

Zhou Dehming, Beijing, China, assignor to Institute of Zoology Academia Sinica, Beijing, China

Filed Mar. 15, 1984, Ser. No. 589,726

Int. Cl.[4] G01N *27/28*

U.S. Cl. 204—299 R **23 Claims**



1. A gel electrophoresis cell unit, comprising:

(a) an upper buffer chamber, containing an upper buffer solution, in the form of a first container having an open end and surrounded with cooling means;

(b) a lower buffer chamber, containing a lower buffer solution in the form of a second container with a shoulder and a plurality of holes in the shoulder, the lower buffer chamber being removably immersed in the upper buffer solution in the upper buffer chamber;

(c) a plurality of toroid sealing means having centrally located apertures removably inserted into said plurality of holes;

(d) a plurality of gel holders with upper and lower ends each containing a gel medium for electrophoresis, the lower ends of the gel holders being removably inserted into the apertures of the toroid sealing means;

(e) an electrode for said lower buffer chamber inserted into the lower buffer chamber;

(f) an electrode for the upper buffer chamber inserted into the upper buffer chamber; and

(g) covering means removably mounted over the upper and lower buffer chambers.

4,613,420

APPARATUS FOR MEASURING IONIC ACTIVITY

Osamu Seshimoto; Yoshio Saito; Teruaki Koizumi, and Masaaki Terashima, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 24, 1985, Ser. No. 694,220

Claims priority, application Japan, Jan. 25, 1984, 59-12795

Int. Cl.[4] G01N *27/28*

U.S. Cl. 204—412 **5 Claims**

1. An apparatus for measuring ionic activity comprising:

a means for supplying slide-type ionic activity measuring devices, one by one, each said measuring device having at least one pair of ion-selective electrodes, each of which generate a potential difference corresponding to the ionic activity of one specific ion, and a porous bridge disposed between the ion-selective layers of at least one pair of said ion-selective electrodes;

a reference spotting means for spotting a substantially predetermined contstant volume of a reference solution on one ion-selective layer of said pair of ion-selective electrodes of said measuring device;

a sample spotting means for spotting a substantially predetermined constant volume of a sample solution on the other ion-selective layer of said pair of ion-selective electrodes of said measuring device;

a discharging chute for discharging said measuring device;

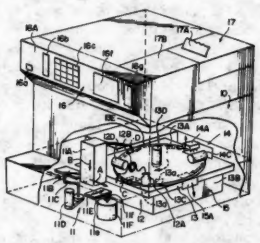
a first conveying means for conveying said measuring device to a measuring section after a sample solution is spotted on the other ion-selective layer of said pair of ion-selective electrodes;

at least one pair of probes electrically connected to a means for measuring potential difference and having needle-like terminals which come into contact with said measuring device so as to measure the potential difference between said pair of ion-selective electrodes;

a second conveying means for conveying said measuring device to said discharging chute after the measurement; and

a cover for substantially shielding said measuring device from an ambibent atmosphere;

said first and second conveying means consisting of a turret which intermittently rotates while successively receiving said measuring devices one after the other; said turret



having a plurality of measuring device receiving portions formed in the periphery of said turret at regular intervals; said reference spotting means being disposed within the rotation area of said turret in connection to a reservoir containing said reference solution and a spotting section of said measuring device, and comprising a dripping nozzle connected to said reservoir so as to drip said reference solution contained therein and a reference solution supplying means which supplies a predetermined constant volume of said reference solution from said reservoir through said nozzle when said measuring device stops below said nozzle; said pair of probes being vertically movable such that said pair of probes come into electrical contact with said pair of ion-selective electrodes so as to measure the potential difference between the ion-selective electrodes when said measuring device is motionless on said turret, and then separates from the ion-selective electrodes before said turret makes its next intermittent move; said discharging chute being formed within the rotation area of said turret so that said measuring device is automatically discharged through said discharging chute by the rotation of said turret after the measurement.

4,613,421

APPARATUS FOR MEASURING IONIC ACTIVITY

Osamu Seshimoto; Teruaki Koizumi; Yoshio Saito, and Akira Yamaguchi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 24, 1985, Ser. No. 694,221

Claims priority, application Japan, Jan. 25, 1984, 59-12794; Jan. 25, 1984, 59-12796

Int. Cl.[4] G01N *27/28*

U.S. Cl. 204—412 **8 Claims**

1. An apparatus for measuring ionic activity comprising:

a means for supplying slide-type ionic activity measuring devices, one by one, each said measuring device having at least one pair of ion-selective electrodes, each of which generate a potential difference corresponding to the ionic activity of one specific ion, and a porous bridge disposed between the ion-selective layers of at least one pair of said ion-selective electrodes;

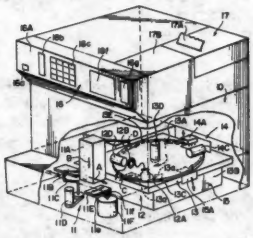
a reference spotting means for spotting a substantially predetermined constant volume of a reference solution on one ion-selective layer of said pair of ion-selective electrodes of said measuring device;

a sample spotting means for spotting a substantially predetermined constant volume of a sample solution on the other ion-selective layer of said pair of ion-selective electrodes of said measuring device;

a discharging chute for discharging said measuring device;

a first conveying means for conveying said measuring device to a measuring section after a sample solution is spotted on the other ion-selective layer of said pair of ion-selective electrodes;

at least one pair of probes electrically connected to a means for measuring potential difference and having needle-like terminals which come into contact with said measuring device so as to measure the potential difference between said pair of ion-selective electrodes;



a second conveying means for conveying said measuring device to said discharging chute after the measurement; and

a cover for substantially shielding said measuring device from an ambient atmosphere;

said first and second conveying means consisting of a turret which intermittently rotates while sucessively receiving said measuring devices one after the other; said reference spotting means being disposed within the rotation area of said turret; said turret having a plurality of measuring device receiving portions formed in the periphery of said turret at regular intervals; said pair of probes being vertically movable in such that said pair of probes come into electrical contact with said pair of ion-selective electrodes so as to measure the potential difference between the ion-selective electrodes when said measuring device is motionless on said turret, and then separates from the ion-selective electrodes before said turret makes its next intermittent move; said discharging chute being formed within the rotation area of said turret so that said measuring device is automatically discharged through said discharging chute by the rotation of said turret after the measurement.

4,613,422

AMBIENT SENSING DEVICES

Imants R. Lauks, Sewell, N.J., assignor to Integrated Ionics Inc., Dayton, N.J.

Filed Jan. 19, 1984, Ser. No. 572,199

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—419 **22 Claims**

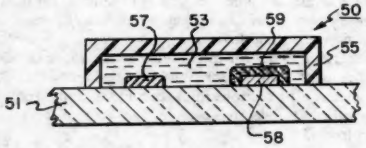
12. A device for the measurement of activity of an ionic species comprising:

a ceramic container filled with an electrolyte medium and containing a reference electrode;

a chemically sensitive layer mounted on an exterior surface of said container;

electronic circuitry connected to said layer and mounted on said surface of said container wherein said chemically sensitive layer and said electronic circuitry are made with materials which are stable at high temperatures;

signal paths interconnecting said chemically sensitive layer and said electronic circuitry;



a hermetic seal encompassing said electronic circuitry; and

one or more continuous semi-permeable layers overlaying said sensitive layer and separating it from an environment in which the device is located but permeable to the chemical or ionic species to be measured, wherein the outermost layer contains polyimide.

4,613,423

CATALYTIC REFORMING PROCESS

George A. Swan; William C. Baird, Jr., and Robert G. Corry, all of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 2, 1985, Ser. No. 729,816

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—65 **55 Claims**

1. In a process for improving the octane quality of a naphtha in a reforming unit comprised of a plurality of serially connected reactors, inclusive of one or more lead reactors and a tail reactor, each of which contains a platinum or platinum-rhenium catalyst, the naphtha flowing in sequence from one reactor of the series to another and contacting the catalyst at reforming conditions in the presence of hydrogen,

the improvement comprising,

providing the tail reactor with a platinum-rhenium catalyst to which iridium has been added in amount sufficient to increase the C_5^+ liquid yield vis-a-vis a similar process utilizing in the tail reactor a platinum-rhenium catalyst to which no iridium has been added.

4,613,424

CATALYTIC REFORMING PROCESS

James J. Schorfheide, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 686,452, Dec. 26, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 773,679

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—65 **12 Claims**

1. In a process for improving the octane quality of a naphtha in a reforming unit comprised of a plurality of serially connected reactors, inclusive of a lead reactor and one or more subsequent reactors, each of which contains a sulfur-sensitive polymetallic platinum-containing catalyst which contains sulfur in concentration ranging from 0.03 to about 0.2 percent, based on the weight of the catalyst, and coke in concentration ranging up to about 10 percent, based on the weight of the catalyst, naphtha and hydrogen being introduced into the lead reactor and flowing in sequence from one reactor to the next subsequent reactor of the series contacting the catalyst at reforming conditions,

the improvement comprising,

introducing sulfur to the tail reactor of the series and maintaining therein, as a component of the naphtha, sulfur in concentration ranging from 0.5 wppm to about 20 wppm, based on the weight of the naphtha feed, while maintaining the concentration of sulfur in the feed naphtha entering the lead reactor below 0.5 wppm.

4,613,425

PROCESS FOR HYDROTREATING HEAVY HYDROCARBON OILS

Hidehiro Higashi; Katsuhiro Shirono, both of Kitakyushu; Yusaku Arima, Fukuoka; Yoichi Nishimura, Yokohama, and Shinichi Yoshida, Kashiwa, all of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1984, Ser. No. 572,097

Claims priority, application Japan, Jan. 21, 1983, 58-7421

Int. Cl.[4] C10G *65/04*

U.S. Cl. 208—89 **6 Claims**

1. A two-stage hydrotreating process for treating a heavy hydrocarbon oil containing asphaltenes and metals, and wherein hard-to-react metals are contained in said asphaltenes, which comprises the steps of: in the first stage, partially demetallizing said heavy hydrocarbon oil by contacting said oil with hydrogen, under the operating conditions of an average reaction temperature of 375°–440° C., a hydrogen partial pressure of 70–230 Kg/cm^2, a hydrogen flow rate of 500–2000 Nm^3 (hydrogen)/Kl (hydrocarbon oil) and an LHSV of 0.1–4 hr^{-1}, in the presence of a first catalyst composition consisting essentially of at least two oxides of metals selected from the group consisting of the metals of Group VB and Group VIII of the Periodic Table, at least one of said metal oxides being an oxide of vanadium, which metal oxides are supported on a first carrier consisting essentially of γ-alumina, the amount of said metal oxides being 10 wt % or less based on the weight of said first catalyst composition, said first catalyst composition having a pore structure satisfying the requirements (a), (b) and (c) set forth hereinafter, said first catalyst having a controlled demetallizing activity so that it is effective to remove easily reactive metals and deposit them in the interiors of the particles of said first catalyst, said first catalyst being substantially ineffective to crack said asphaltenes containing hard-to-react metals so that the hard-to-react metals contained in uncracked asphaltenes are not removed; and thereafter, in the second stage, hydrotreating the partially demetallized hydrocarbon oil by contacting said partially demetallized hydrocarbon oil with hydrogen, under the same operating conditions as as defined above, in the presence of a second catalyst composition comprising at least two oxides of metals selected from the group consisting of the metals of Group VIB and Group VIII of the Periodic Table, which metal oxides are supported on a second carrier, said second carrier consisting of γ-alumina or alumina containing zeolite, said zeolite being a zeolite that is effective for use as a catalyst carrier of a catalyst for hydrotreating processes, the amount of said metal oxides being 30 wt. % or less based on the weight of said second catalyst composition, the content of said metal oxides in said first catalyst composition being less than the content of said metal oxides in said second catalyst composition, said second catalyst being effective to crack said asphaltenes so that said hard-to-react metals are removed and are deposited in the interiors of the particles of said second catalyst, said second catalyst composition having a pore structure satisfying the following requirements (a), (b) and (c):

(a) when measured by the nitrogen adsorption method, pores whose diameters are in the range of 0–600 Å have an average diameter of 100–180 Å, the total volume occupied by pores whose diameters are in the range of the average diameter ±20 Å is at least 60% of that occupied by pores whose diameters are 0–600 Å, the total volume occupied by pores whose diameters are 50 Å or less is 10% or less of that occupied by pores whose diameters are 0–600 Å, the total volume occupied by pores whose diameters are in the range of 200–300 Å is 5% or less of that occupied by pores whose diameters are 0–600 Å, and the total volume occupied by pores whose diameters are 300 Å or more is 3% or less of that occupied by pores whose diameters are 0–600 Å,

(b) when measured by means of a high pressure mercury porosimeter, pores whose diameters are in the range of 62–600 Å have an average diameter of 100–170 Å, the total volume occupied by pores whose diameters are in the range of average diameter ±20 Å is at least 70% of the volume occupied by pores whose diameters are 62–600 Å, the volume occupied by pores whose diameters are 100 Å or less is 10% or less of that occupied by pores whose diameters are 62–600 Å, and the volume occupied by pores whose diameters are 200 Å or more is 5–15% of that occupied by pores whose diameters are 62–600 Å,

(c) and the specific surface area is 170–270 m^2/g, and the volume occupied by pores having a diameter of 600 Å or less, is 0.57–0.95 ml/g.

4,613,426

THERMAL CRACKING PROCESS FOR PRODUCING PETROCHEMICAL PRODUCTS FROM HYDROCARBONS

Toshiro Okamoto, Tokyo, and Michio Ohshima, Hiroshima, both of Japan, assignors to Mitsubishi Jukoygo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,713
Claims priority, application Japan, Jun. 30, 1983, 58-119306
Int. Cl.[4] C10G *47/00, 47/22*
U.S. Cl. 208—107 4 Claims

1. A thermal cracking process for producing petrochemical products from hydrocarbons which comprises the steps of

(a) burning starting hydrocarbons with oxygen in the presence of steam to produce a hot gas of from 1300° to 3000° C. comprising steam;

(b) feeding a mixture of methane and hydrogen to the hot gas in such a way that a methane/hydrogen molar ratio of the hot gas is over 0.05;

(c) further feeding a plurality of streams of starting hydrocarbons containing hydrocarbon components of higher and lower boiling points to the hot gas comprising the methane, hydrogen and steam such that the plurality of streams of starting hydrocarbons are fed to a plurality of different temperature zones of a reactor so that the hydrocarbon streams having higher boiling points are fed to higher temperature zones and the hydrocarbon streams comprising lower temperature components are fed to lower temperature zones, respectively;

(d) subjecting the starting hydrocarbons to thermal cracking while keeping the cracking temperature at 650° to 1500° C., the total residence time of individual feed streams at 5 to 1000 milliseconds, the pressure at 2 to 100 bars, and the partial pressure of hydrogen, after thermal cracking of a hydrocarbon comprising hydrocarbon components whose boiling point exceeds 200° C., at least 0.1 bar; and

(e) quenching the resulting reaction product.

4,613,427

PROCESS FOR THE DEMETALLIZATION AND HYDROCONVERSION OF HEAVY CRUDES AND RESIDUES USING A NATURAL CLAY CATALYST

Gonzalo Sepulveda; Marcos Rosa-Brussin; Nereida Carrion; Pedro Roa; Alfredo Morales Ruiz; Jose Guitian; Otto Rodriguez, and Carlos Zerpa, all of Caracas, Venezuela, assignors to Intevep, S.A. and Universidad Central de Venezuela, both of Caracas, Venezuela

Division of Ser. No. 657,150, Oct. 3, 1984, Pat. No. 4,568,657.
This application Aug. 28, 1985, Ser. No. 770,098
Int. Cl.[4] C10G *45/04, 47/04, 47/12*
U.S. Cl. 208—111 4 Claims

1. A process for the hydrodemetallization and hydroconversion of a heavy hydrocarbon charge characterized by a nickel content of more than 100 ppm, a vanadium content of more than 100 ppm, a sulfur content of more than 2% and an asphaltene content of more than 8% comprising providing a natural catalyst formed by treating a naturally occurring clay having the following composition based on total dry weight: Fe_2O_3 3.0 to 10.0 wt. %, SiO_2 40 to 75 wt. %, Al_2O_3 10 to 25 wt. %, MgO 0.1 to 0.8 wt. %, K_2O 0.3 to 2.6 wt. % and Na_2O 0.1 to 1.5 wt. % in an acid bath so as to obtain a catalyst characterized by a highly dispersed iron content on the surface thereof, said catalyst having a chemical composition comprising 2 to 10 wt. % Fe_2O_3, 40 to 80 wt. % SiO_2 and 8 to 25 wt. % Al_2O_3 and an iron surface composition measured by XPS techniques is in a ratio of from about I(Fe)/I(Si+ Al) of between 0.2 to 0.9, subjecting said catalyst to hydrogen stream reduction at a temperature of between 300° and 500° C. for 1 hour at a hydrogen pressure of between 500 and 3500 psig, pre-sulfurizing said catalyst with a substance selected from the group consisting of H_2S/H_2 and CS_2/gas oil and contacting the heavy hydrocarbon charge with said catalyst in a zone in the presence of hydrogen so as to convert said heavy hydrocarbon charge into a light hydrocarbon.

4,613,428

HYDROCARBON CRACKING PROCESS

Robert R. Edison, Olympia Fields, Ill., assignor to Katalistiks, Inc.

Filed Jul. 13, 1983, Ser. No. 513,535
Int. Cl.[4] C10G *11/00*
U.S. Cl. 208—113 43 Claims

1. In a hydrocarbon cracking process in which solid particles capable of promoting the cracking of a sulfur-containing hydrocarbon feedstock in intimate admixture with a minor amount of discrete entities effective to reduce atmospheric emissions of sulfur oxides from said process and having a composition different than said solid particles are circulated between at least one reaction zone wherein said feedstock is contacted with said solid particles and discrete entities at hydrocarbon cracking conditions to convert at least a portion of said feedstock and form sulfur-containing deposits on said solid particles, and at least one regeneration zone wherein at least a portion of said deposits is removed from said solid particles to produce regenerated solid particles which are circulated to said reaction zone and sulfur oxides; said discrete entities comprising at least one metal-containing component capable of associating with at least one sulfur oxide at the conditions present in said regeneration zone and of disassociating with said sulfur oxide at the conditions present in said reaction zone; the improvement comprising contacting said regenerated solid particles and discrete entities with at least one gaseous reducing medium prior to said solid particles and discrete entities entering said reaction zone thereby increasing the disassociation of said sulfur oxides from said discrete entities, provided that said solid particles and said discrete entities are present in separate particles and substantially all of said gaseous reducing medium entering said reaction zone with said regenerated solid particles and discrete entities.

4,613,429

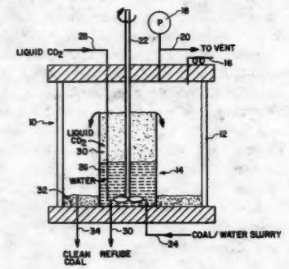
PROCESS FOR REMOVING MINERAL MATTER FROM COAL

Shiao-Hung Chiang, and George E. Klinzing, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Jul. 5, 1984, Ser. No. 628,291
Int. Cl.[4] B03D *1/00*
U.S. Cl. 209—5 12 Claims

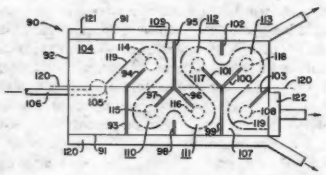
1. A process for removing mineral matter from a process water slurry of pulverized feed coal comprising coal and coal minerals, the process comprising establishing a contacting zone at a temperature and pressure such that carbon dioxide and the coal-process water slurry exist as a two phase liquid-liquid mixture, contacting said coal-process water slurry with liquid carbon dioxide in said contacting zone so as to allow the liquid carbon dioxide to preferentially coat said pulverized feed coal, the temperature and pressure in the contacting zone further being such that carbon dioxide microbubbles form on said pulverized feed coal during said contacting step, separating a demineralized coal and a liquid carbon dioxide phase from said

contacted mixture as a relatively light fraction and a concentrated coal minerals and process water phase as a relatively



heavy fraction, removing said relatively light fraction from said contacting zone and separately removing said relatively heavy fraction from said contacting zone.

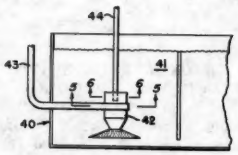
4,613,430
FROTH FLOTATION SEPARATION METHOD AND APPARATUS
Francis G. Miller, P.O. Box 501, Ligonier, Pa. 15658
Division of Ser. No. 574,869, Jan. 30, 1984, abandoned. This application Dec. 10, 1984, Ser. No. 679,981
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—167 **6 Claims**



6. In a method for separating solids from an aqueous slurry containing said solids in a generally rectangular froth flotation tank having sidewalls, end walls and a bottom wall by froth flotation into a float product and a non-float product including a plurality of sequential flotation zones, including a first froth flotation zone, a last froth flotation zone and at least two intermediate froth flotation zones, introducing aqueous slurry of solids into said first froth flotation zone, recovering non-float solids from said last froth flotation zone and recovering float solids from said first and said intermediate froth flotation zones, agitating said aqueous slurry of unrecovered solids in each said froth flotation zone and introducing flotation gas in each said froth flotation zone; the improvement comprising:

conducting said method in a froth flotation tank having baffle means between said first froth flotation zone and said last froth flotation zone, said baffle means extending from said bottom wall upwardly substantially to the upper edge of said sidewalls, a first baffle means extending from one said sidewall toward the opposite sidewall through a geometric mid-plane between said sidewalls and spaced from said opposite sidewall and a second baffle means extending from said opposite sidewall toward said one sidewall through said vertical midplane between said sidewalls and spaced from said one sidewall, said baffle means defining a portion of a slurry flow path adjacent said sidewalls, advancing said aqueous slurry through said vertical midplane between said sidewalls of said froth flotation tank at least twice between said first froth flotation zone and said last froth flotation zone, whereby the aqueous slurry flowing through the said intermediate froth flotation zones experiences at least two changes in direction prior to entering the last froth flotation zone.

4,613,431
FROTH FLOTATION SEPARATION APPARATUS
Francis G. Miller, P.O. Box 501, Ligonier, Pa. 15658
Continuation of Ser. No. 574,869, Jan. 30, 1984, abandoned, which is a division of Ser. No. 679,981, Dec. 10, 1984. This application Oct. 15, 1985, Ser. No. 787,263
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—169 **2 Claims**



1. In a froth flotation tank for separating solids into a float product and a non-float product including a plurality of directly communicating sequential froth flotation zones, a plurality of vertical baffles defining the said sequential froth flotation zones, each said zone containing aqueous slurry of unrecovered solids; each of said froth flotation zones including means for agitating the said aqueous slurry, means for introducing froth flotation gas and means for forming bubbles of said froth flotation gas; means for collecting the said float product from said froth flotation zones; feed means for introducing an aqueous slurry of said solids into a first of said froth flotation zones; unobstructed passageway means between said baffles for delivering aqueous slurry of unrecovered solids sequentially through the successive froth flotation zones; means in the last of said froth flotation zones recovering the said non-float product; the improvement comprising:

the said first froth flotation zone is larger than any of the successive froth flotation zones in the froth flotation tank whereby the mean residence time of said aqueous slurry is longer in the said first froth flotation zone than in any of the successive froth flotation zones in the said froth flotation tank; and the said mens for agitating and the said means for introducing froth flotation gas in said first zone introduce less energy per unit volume of aqueous slurry therein than the said means for agitating and the said means for introducing froth flotation gas introduce in any of said successive froth flotation zones.

4,613,432
PULP SCREEN
Bill A. Racine, Hacienda Heights; Marvin D. Hixson, Manhattan Beach, and Gene A. Huber, Los Angeles, all of Calif., assignors to Sweco, Incorporated, Los Angeles, Calif.
Continuation of Ser. No. 477,064, Mar. 21, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,060
Int. Cl.[4] B07B *1/28*
U.S. Cl. 209—254 **6 Claims**

1. A vibratory separator comprising

a frame;

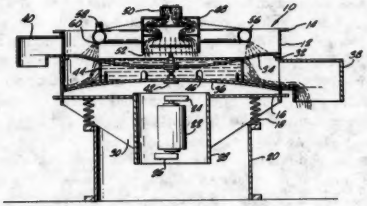
spring means for resiliently supporting said frame;

means for inducing vibration in said frame;

a horizontally disposed, downwardly concaved screen mounted in said frame, said concavity defining a central lower portion and a peripheral elevated portion;

a dished plate spaced from the bottom of said screen defining a chamber beneath said screen extending upwardly to an outer rim spaced from the underside of said screen to an

elevation above said lower portion of said screen circumferentially about said lower portion; and



an annular outlet between said outer rim and the underside of said screen.

4,613,433
ANAEROBIC FERMENTOR

Kevin J. McKeown, Windermere, England, assignor to Biomass Limited, England

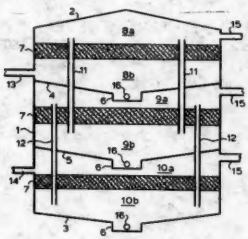
PCT No. PCT/GB83/00348, § 371 Date Aug. 24, 1984, § 102(e) Date Aug. 24, 1984, PCT Pub. No. WO84/02518, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 20, 1983, Ser. No. 645,314

Claims priority, application United Kingdom, Dec. 24, 1982, 8236830

Int. Cl.⁴ C02F *11/04*; C12P *5/02*

U.S. Cl. 210—150 **1 Claim**



1. An anaerobic fermentor comprising

(i) a container vessel divided into at least two compartments each having a floor, a roof, and means for dividing the compartment into superposed zones and permitting upward fluid passage between the zones, said dividing and upward fluid passage means comprising a layer of liquid-pervious packing material disposed horizontally across the compartment at a position intermediate the roof and the floor with its lower surface upwardly spaced from the floor to define a fermentation zone therebetween and its upper surface downwardly spaced from the roof;

(ii) liquid conduit means connecting successive compartments in series and providing downward liquid flow from the space between the roof and packing layer of one compartment to the space between the floor and packing layer of a succeeding compartment;

(iii) means for introducing liquid to be treated into the space between the packing layer and the floor of the first of the successive compartments;

(iv) means for removing treated liquid from the space between the packing layer and roof of the last of the successive compartments;

(v) means provided in at least one fermentation zone for discharging solids from the fermentor; and

(vi) means provided in each compartment between the upper surface of the packing layer and the roof of the compartment for discharging gas.

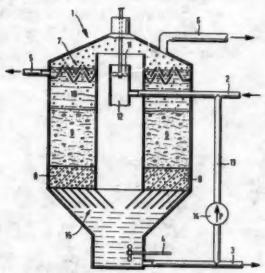
4,613,434
DEVICE FOR TREATMENT OF WASTEWATER BY MEANS OF ANAEROBIC FERMENTATION

Raimo Määttä, Helsinki, Finland, assignor to Oy Tampella AB, Finland

Filed Jan. 18, 1983, Ser. No. 458,816

Int. Cl.⁴ C02F *11/04*

U.S. Cl. 210—151 **9 Claims**



1. A device for treatment of wastewater by anaerobic fermentation which comprises:

a closed tank,

a filter dividing said tank into upper and lower compartments, said upper compartment being useful in the treatment of wastewater with methane producing bacteria and said lower compartment being useful in the treatment of wastewater with acid producing bacteria,

said filter including a bed of a particulate filter media action as an attachment means for said methane producing bacteria and preventing said methane producing bacteria from being completely removed from said tank with said treated wastewater, said filter further including a fluidized bed overlying said bed of said particulate filter media, said fluidized bed including sludge and a fluidizing agent,

means for feeding wastewater to be treated into said lower compartment below said filter,

means for removing treated wastewater, gas and sludge from said upper compartment,

means for mixing wastewater in said lower compartment, and

means for separating gas in said upper compartment;

wherein said upper and lower compartments and said filter are associated such that wastewater fed into said lower compartment is treated with said acid producing bacteria, passed through said filter, and treated with said methane producing bacteria, and wastewater passing from said lower compartment into said upper compartment is incapable of recirculation to said lower compartment.

2. The device of claim 1 further comprising a lamella separator below said filter in said lower compartment, said lamella separator distributing water upwardly and evenly through said filter facilitating the growth of the bubbles in said wastewater, and separating portions of sludge in said wastewater and returning them to said lower compartment.

4,613,435
MAGNETIC OIL FILTER

Fred N. Shoemaker, 264 N. 56th St., Mesa, Ariz. 85205

Filed Jul. 2, 1985, Ser. No. 751,151

Int. Cl.⁴ B03C *1/02*

U.S. Cl. 210—222 **5 Claims**

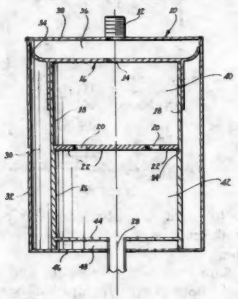
1. A filter for removing particulate matter from lubricating oil, comprising:

an outer container, said container having a top plate member having at least one oil inlet aperture passing therethrough, and a bottom plate member having at least one oil outlet aperture passing therethrough;

an inner container having an inner top plate member having at least one oil inlet aperture passing therethrough, and an inner bottom plate member having at least one oil outlet aperture passing therethrough;

a highly magnetized magnetic plate means having a plurality of apertures passing therethrough, firmly attached within said inner container for removing undesired metallic particulate matter from lubricating oil passing therethrough;

said inner top plate member further having flexible sealing means for contacting an inner surface of said outer container thereby firmly seating said inner container away from said outer container;



said inner container further comprising inner side walls having an upper portion and a lower portion thereof, thereby forming a ledge for firmly holding said highly magnetized magnetic plate means having said plurality of apertures passing therethrough;

an upper chamber being defined by said inner top plate member having said oil inlet aperture passing therethrough, said upper portion of said side walls, and said highly magnetized magnetic plate means having said plurality of apertures passing therethrough; and

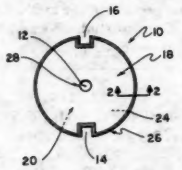
a lower chamber being defined by said highly magnetized magnetic plate means having said plurality of apertures passing therethrough, said lower portion of said side walls, and said inner bottom plate.

4,613,436

MEMBRANE ASSEMBLY FOR FLUID SEPARATIONS-DISK

William W. Wight, Alta Loma, and Richard A. Becker, San Gabriel, both of Calif., assignors to Separex Corporation, Anaheim, Calif.

Filed Oct. 31, 1984, Ser. No. 666,830
Int. Cl.[4] B01D *31/00*
U.S. Cl. 210—232 **22 Claims**



1. A device for the separation of two or more different materials comprising:

a pressure vessel adapted to contain fluids under pressure,

means for admitting feed fluid to be separated to said vessel,

means for removing residue from said vessel,

means for removing permeate from said vessel,

at least one compact stacked assembly within said vessel adapted to be pre-tested and comprising a plurality of elements disposed in superposed relationship, said elements including separator membranes, distribution zones for providing lateral flow of feed fluid to be separated across the active faces of said membranes, and permeate carrier elements abutting the opposed faces of the membranes to carry away permeate,

means for providing a wide range of sizes and for precluding misalignment which includes said elements in said stacked assembly having registered edge notches at two spaced-apart points, one of said registered edge notches forming a feed channel for feed fluid to be separated and the other of said registered edge notches forming a residue collection channel, said distribution zone being in fluid communication with said feed and residue collection channels at said registered notches, and said elements also having registered internal apertures forming a permeate collection channel which is in fluid communication with said permeate carrier elements,

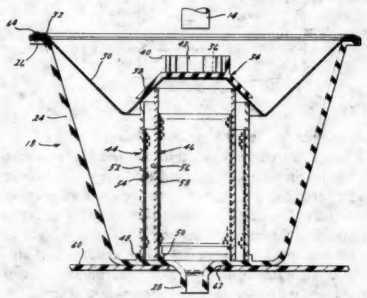
said stacked assembly being disposed between said means for admitting and said means for removing.

4,613,437

COOLANT FILTERING SYTEM

Ronald C. Wiand, 1255 Villa, Birmingham, Mich. 48008

Filed Jul. 24, 1984, Ser. No. 634,144
Int. Cl.[4] B01D *29/26*
U.S. Cl. 210—315 **19 Claims**



1. A filter assembly for removing particulates from coolant fluid comprising:

a bowl-shaped outer shell having an upper opened end and a lower end having a coolant outlet duct,

a primary filter screen covering said upper opened end of said outer shell,

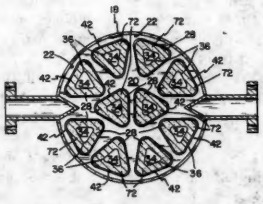
cylindrical filter means mounted within said outer shell such that coolant fluid passing through said primary filter screen must pass through said filter means before being discharged through said coolant outlet duct, and

a coolant distribution dish mounted to said primary filter screen and covering a central portion of said primary filter screen, said dish further covering the outside diameter of said cylindrical filter means thereby preventing said coolant fluid from passing directly to said coolant outlet duct.

4,613,438
TRIANGULAR FILTER CARTRIDGE AND APPARATUS

Howard T. DeGraffenreid, P.O. Box 261, Inola, Okla. 74036

Filed Jul. 19, 1984, Ser. No. 632,451
Int. Cl.[4] B01D *29/32*
U.S. Cl. 210—323.1 12 Claims



1. A fluid filter apparatus comprising:

a vessel having a generally cylindrical inner surface and a longitudinal axis, an inlet for receiving therethrough a fluid to be filtered, and means defining an outlet for discharging therethrough a filtered liquid,

a filter cartridge assembly for filtering a fluid and comprising a plurality of individually replaceable filter cartridges disposed in said filter vessel,

each said replaceable filter cartridge comprising an elongate permeable filter medium including means defining a passage therein in communication with said vessel outlet, said filter medium remaining in an essentially constant configuration throughout the filtering process, a porous support member being in supporting relationship with said elongate permeable medium, and a pair of end caps secured to respective opposite ends of said elongate permeable filter medium, one of said end caps being sealingly disposed between said filter medium and said vessel outlet and having means defining an opening in communication with said filter medium passage and said vessel outlet, said elongate permeable filter medium having a generally triangularly shaped outer peripheral surface having three substantially flat elongate sides, adjacent ones of the elongate sides being joined by an arcuate portion so that each triangularly shaped filter cartridge has rounded corners,

at least some of said filter cartridges being arranged in a generally circular pattern around the inner cylindrical surface of the vessel such that a flat side of each of said cartridges in the circular pattern is in direct facing relationship with said vessel inner surface and an opposite rounded corner of the cartridge faces radially inward toward the longitudinal axis of said vessel, adjacent flat sides of adjacent cartridges in the circular pattern generally facing each other, whereby the filter cartridges are closely spaced within said vessel thereby increasing filtration capacity.

4,613,439
STRAINER

James G. Fuhs, P.O. Box 6134, Modesto, Calif. 95355

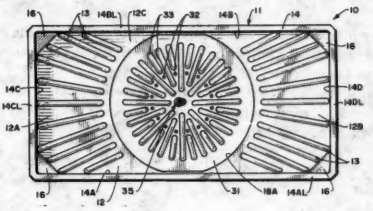
Filed Mar. 6, 1985, Ser. No. 708,563
Int. Cl.[4] B01D *23/02*
U.S. Cl. 210—471 12 Claims

1. A strainer for the defrosting of frozen food commodities which is adapted to be mounted on a 55 gallon drum or the like, comprising:

a vessel having spaced upstanding sidewalls and spaced upstanding front and rear walls,

a central flat zone having a central opening therein, said flat zone connected to said front and rear walls at the bottom edge thereof,

a can mount wall surrounding said central opening and depending vertically downwardly, said can mount wall sized to fit within a disposal drum, and



a removable lid covering said central opening, said lid having a plurality of perforations therein, said perforations occupying only a portion of the surface area of the lid.

4,613,440
COMPOSITE MEMBRANES BASED ON INTERPENETRATING POLYMER NETWORKS

Joseph J. Zupancic, Bensenville, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 485,971, Apr. 18, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,187
Int. Cl.[4] B01D *13/04*
U.S. Cl. 210—490 11 Claims

1. A composite semipermeable membrane which comprises an interpenetrating polymer network of:

(1) an isocyanate-capped polyether component which is obtained by reacting a polyether with an isocyanate, said isocyanate-capped polyether being phsycially entwined with

(2) a heterocyclic nitrogen-containing component selected from the group consisting of polyvinylpyridine and mixtures of polyvinylpyridine and poly(N-vinylpyrrolidone) wherein the ratio by weight of polyvinylpyridine to poly(N-vinylpyrrolidone) ranges from about 1:1 to 4:1, said interpenetrating polymer network being supported on a porous backing support material; and

(3) said component (1) being physically entwined with component (2) by means of a substituted polyurea, said polyurea being formed by curing of said membrane at a temperature in the range of from about ambient to about 100° C. in an atmosphere which possesses a relative humidity in the range of from about 20% to about 100% for a period of time sufficient to generate an amine-capped polymer by hydrolysis of a portion of said isocyanate-capped polyether, with said amine-capped polymer subsequently reacting with a portion of isocyanate groups present in said membrane to form a substituted polyurea which serves to physically entwine said component (2) in said membrane.

4,613,441
THERMOPLASTIC RESIN POROUS MEMBRANE HAVING AN INCREASED STRENGTH FACTOR

Mitsuo Kohno; Shigeki Katayama, and Kazuo Matsuda, all of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

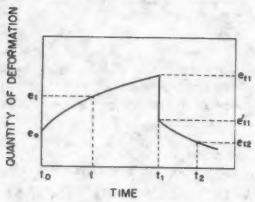
Continuation of Ser. No. 261,913, May 5, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 486,915
Claims priority, application Japan, May 15, 1980, 55-63342
Int. Cl.[4] B01D *13/04*
U.S. Cl. 210—500.36 7 Claims

1. A thermoplastic resin porous membrane which is formed of a thremoplastic resin having a critical surface tension of from 20 to 33 dyn/cm and having a three-dimensional network structure wherein communicating pores having a porosity of at least 60% and an average pore diameter of 0.1 to 2.0 microns

are formed; the porous membrane having a strength factor F defined by the following formula (1):

$$F=A/(B(1-\alpha)) \quad (1)$$

wherein A stands for the tensile strength at break of the porous membrane, B stands for the tensile strength at break of a non-porous film formed of the same resin and α stands for the porosity fraction of the porous membrane, of at least 1 as measured in any direction, a modulus factor F' defined by the following formula (2):



$$F'=C/(D(1-\alpha)) \quad (2)$$

wherein C stands for the tensile stress of the porous membrane at 5% deformation, D stands for the tensile stress of a non-porous film formed of the same resin at 5% deformation and α stands for the porosity fraction of the porous membrane, of at least 0.2 as measured in any direction; a maximum pore diameter not larger than 3.25 times the average pore diameter and a thickness of from 5 to 500 microns.

4,613,442

NOVEL OPTICALLY ACTIVE POLYMER, PREPARATION AND USE

Heimei Yuki, Sakai, and Yoshio Okamoto, Amagasaki, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

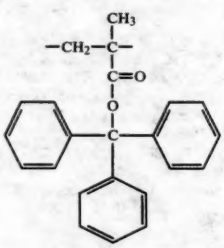
Division of Ser. No. 443,725, Nov. 22, 1982, Pat. No. 4,375,495, which is a division of Ser. No. 235,233, Feb. 17, 1981, Pat. No. 4,511,475. This application Jan. 9, 1985, Ser. No. 690,029

Claims priority, application Japan, Feb. 19, 1980, 55-19555

Int. Cl.[4] C09K *00/00*; G01N *30/02*

U.S. Cl. 252—1 **4 Claims**

1. Packing particles for use in effecting optical resolution of a racemic mixture comprising a stereoregular, highly isotactic, optically active polymer comprising recurring structural units of the formula:



and having a polymerization degree of not less than 5, said polymer having a specific rotation $[\alpha]_D^{20}$ of not less than 50° as an absolute value, either + or −, and another solid material.

4,613,443

NONCONDUCTING THREAD LUBRICANT

M. Vikram Rao; Manmohan S. Kalsi, both of Houston, and Patricio D. Alvarez, Rosenberg, all of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,381

Int. Cl.[4] C10M *131/04, 141/00*

U.S. Cl. 252—21 **8 Claims**

1. A thread sealing composition comprising:

from about 1 to about 10 percent by weight of a hard, moderately deformable material having a Moh's hardness in the range of from about 2 to about 4;

from about 20 to about 50 percent by weight of a soft, moderately deformable, electrically non-conductive material having a Moh's hardness in the range of from about 1 to about 2;

from about 1 to about 10 percent by weight of a lubricating solid having a Moh's hardness of less than about 1; and

a lubricating grease base.

4,613,444

REVERSIBLE PHASE CHANGE COMPOSITIONS OF CALCIUM CHLORIDE HEXAHYDRATE WITH POTASSIUM CHLORIDE

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1982, Ser. No. 364,159

Claims priority, application Japan, Apr. 15, 1981, 56-055719

Int. Cl.[4] C09K *5/06*

U.S. Cl. 252—70 **43 Claims**

19. In a reversible liquid/solid phase change composition comprising a mixture of $CaCl_2.6H_2O/KCl/NaCl/SrCl_2.6H_2O$ and impurities in an amount of less than 3 weight percent of the total weight of the composition, the improvement comprising the addition of KCl and NaCl in amounts sufficient to obtain an effectively congruently melting mixture.

4,613,445

ORGANOPHOSPHATE-CONTAINING ANTIFREEZE

John L. Haack, Elmsford, and Paul H. Mohr, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 23, 1984, Ser. No. 633,210

Int. Cl.[4] C09K *5/00*

U.S. Cl. 252—75 **10 Claims**

1. An antifreeze composition concentrate comprising:

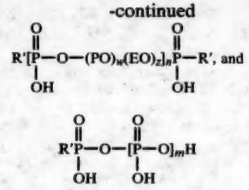
(a) alcohol,

(b) at least one buffer selected from the group consisting of salts of boric, phosphoric, benzoic, substituted benzoic, dibasic acids having 6 to 20 carbon atoms, and mixtures thereof, and

(c) at least one alkylene oxide-containing organophosphate, in a corrosion inhibiting-effective amount, said organophosphate being selected from the group consisting of PO- and PO/EO-containing organophosphate mono-, di- and triesters and mixtures thereof, wherein the PO content is at least 60% based on the weight of the total PO+EO in the ester and wherein the PO-containing organophosphate esters have a molecular weight between 650 and 1400 and wherein the PO/EO-containing organo-phosphate esters have a molecular weight between 1100 and 4500, and wherein said organophosphate is selected from the group defined by the following structural formulae I, II and III:

$$R'_kP(OH)_{3-k} \quad (I)$$

-continued



(II)

(III)

wherein

R'=[RO(PO)$_x$(EO)$_y$] wherein R=H or alkyl, aryl, alkylaryl, arylalkyl, alkenyl or alkynyl having up to 24 carbon atoms,

PO=Propylene oxide radical,

EO=Ethylene oxide radical,

x=1 to 100,

y=0 to 100,

k=1 to 3, with the proviso that when k=3, at least one R' group is removed from the phosphate ester by hydrolysis prior to or during use,

n=1 to 100,

w=0 to 100, with the proviso that when w>1, x can be zero,

z=0 to 100,

m=1 to 10.

4,613,446

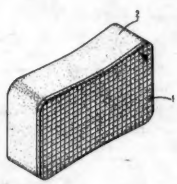
GELLED DETERGENT COMPOSITION AND CLEANING PADS CONTAINING SAME

Arpad M. Magyar, Conroe, Tex., assignor to Pennzoil Company, Houston, Tex.

Filed Mar. 13, 1985, Ser. No. 711,151

Int. Cl.[4] C11D *9/14;* B08B *1/00*

U.S. Cl. 252—91 **14 Claims**



1. A detergent composition having a pH of about 7.5 to 8.5, and comprising, in weight percent:

50–60% water;

2–10% alkali metal hydroxide solution having a concentration of 40–60 weight percent alkali metal hydroxide;

1–10% alkali metal polyphosphate;

5–20% sulfate wetting agent for penetrating a dirt film on a surface to be cleaned;

10–20% fatty acid for reacting on contact with the alkali metal hydroxide to form a soap;

0.1–5% chelating agent for reacting with the alkali metal of the alkali metal hydroxide to form a water soluble derivative; and

5–20% surfactant selected from the group consisting of anionic, nonionic and cationic surface active agents for emulsifying the composition.

4,613,447

COMPOSITION FOR CLEANSING AND WIPING THE CIRCUMANAL REGION

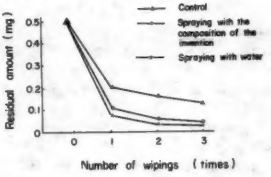
Kenji Hara, Ichikaimachi, and Yasuteru Eguchi, Utsunomiya, both of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,759

Claims priority, application Japan, Jun. 7, 1983, 58-101336

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—91 **6 Claims**



1. A composition for cleansing and wiping the circumanal region consisting essentially of (1) at least one oil selected from the group consisting of vegetable oils, animal oils and synthetic oils and (2) 10 to 80 wt. % of a silicone oil, said composition having a viscosity of not more than 30 cs as measured at 5° C.

4,613,448

DETERGENT COMPOSITIONS

Bao-Ding Cheng, Highland Park, N.J., assignor to The Colgate-Palmolive Co., New York, N.Y.

Continuation of Ser. No. 400,175, Sep. 24, 1973, abandoned. This application Mar. 29, 1979, Ser. No. 25,092

Int. Cl.[4] C11D *3/20, 17/08*

U.S. Cl. 252—157 **11 Claims**

1. A cleaning composition comprising 1–95% by weight of a detergent and from 5–95% by weight of a detergent builder selected from the group consisting of tetrahydroxysuccinic acid and the water-soluble salts thereof, said detergent and said detergent builder being present in a weight ratio of 1:20 to 20:1, said composition providing an aqueous wash solution having a pH of at least 8.5.

7. A cleaning composition as defined in claim 1 comprising from 10–85% by weight of a detergent, from 5–95% by weight of a detergent builder selected from the group consisting of tetrahydroxysuccinic acid and the water-soluble salts thereof, from 7–25% by weight of a C_2–C_4 mono or polyhydroxy alcohol and from 5–75% by weight of water, said composition being a clear homogeneous liquid, said composition having a pH of at least 8.5.

4,613,449

COMPOSITIONS FOR CLEANING ALUMINUM

John A. Dingess, Wheeling, Ill., assignor to Safety-Kleen Corporation, Elgin, Ill.

Filed Oct. 3, 1984, Ser. No. 657,231

Int. Cl.[4] C11D *17/00;* B08B *7/00*

U.S. Cl. 252—174.17 **10 Claims**

1. An aluminum cleaning composition comprising, in combination, from about 2 to about 5 parts by weight of a strong alkali metal hydroxide, from about ½ to about 2 parts by weight of calcium chloride, from about 2 to about 4 parts by weight of sucrose, from about 0.05 to about 0.2 parts by weight of a non-ionic surface active agent and from about 0.2 to about 0.5 parts of an organic anti-foaming agent, said composition being adapted, when diluted with from about 40 to about 75 parts by weight of water, to clean soiled aluminum surfaces without damage thereto during an immersion of up to 25 hours.

4,613,450
ANTICORROSION MEANS AND COMPOSITIONS CONTAINING SAME

Francis Moran, Paris; Sylvain Rocher, Le Mans; Louis Cot, Castelnau le Lez; Francis Dabosi, Ramonville Saint Agne; Michel Duprat, Castanet Tolosan, and Jean Durand, Montpellier, all of France, assignors to Union Chimique et Industrielle de l'Ouest, France

Continuation of Ser. No. 497,572, May 24, 1983, abandoned.
This application Mar. 25, 1985, Ser. No. 715,918
Claims priority, application France, May 28, 1982, 82 09426
Int. Cl.[4] C02F 5/10
U.S. Cl. 252—181 6 Claims

1. A method for protecting metallic surfaces which are in contact with a corrosive aqueous energic or thermic fluid and tend to be corroded thereby which comprises incorporating in said fluid between 3 and 500 ppm by weight of a fluorophosphate compound corrosive inhibitor selected from the group consisting of:

(i) compound of the formula $M_2^IPO_3F$, xH_2O
(ii) compound of the formula LiM^IPO_3F, xH_2O
(iii) compound of the formula NaM^IPO_3F, xH_2O
(iv) compound of the formula $M^{II}PO_3F$, xH_2O
(v) compound of the formula $M_2^IM^{II}(PO_3F)_2$, xH_2O
(vi) compound of the formula $M^IPO_2F_2$, xH_2O
(vii) compound of the formula $M^{II}(PO_2F_2)_2$, xH_2O and
(viii) mixtures thereof ;wherein M^I is Na, K, Rb, Cs or HN_4; M^{II} is Mg, Ca, Ba, Sr, Zn, Cd, Mn, Ni or Co; and x is an integer or a fractional number comprised between 0 and 6.

4,613,451
GELABLE BLENDS OF ORGANOSILICON-CONTAINING MATERIALS AND HYDROPHOBIC POLYOLS

Wen-Hsuan Chang, and David T. McKeough, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1983, Ser. No. 462,590
Int. Cl.[4] C09K 3/00
U.S. Cl. 252—182 27 Claims

1. A liquid composition useful for coating a substrate comprising a mixture of components:

(A) at least one hydrophobic polyol; and

(B) an organosilicon-containing material containing less than 10 percent by weight based on the total weight of said organosilicon-containing material of unhydrolyzed aminoalkylsilane comprising

at least one organosilicon-containing substance free of functional groups attached to carbon and essentially free of alkali metal ions, having atoms bonded directly to Si all of said atoms being selected from O, N, Cl or a combination thereof, said organosilicon-containing substance additionally having moieties directly bonded to Si which are displaceable by reaction with water, alcohol or a combination thereof, wherein at least part of said organosilicon-containing substance is hydrolyzed to a compound or mixture of compounds, said compound or mixture of compounds containing a residual amount of said moieties directly bonded to Si which are displaceable;

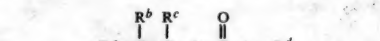
wherein after said components are mixed said composition is a homogeneous liquid which is capable of self curing to a continuous film by reaction, with moisture, with said hydrophobic Polyol, or with a combination thereof, of said residual moieties bonded directly to Si which are displaceable.

4,613,452
AQUEOUS ACIDIC HYDROGEN PEROXIDE COMPOSITION CONTAINING ENOL ESTER ACTIVATOR

William R. Sanderson, Warrington, England, assignor to Interox Chemicals Limited, London, England

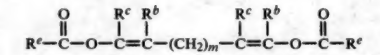
Filed Oct. 23, 1984, Ser. No. 664,397
Claims priority, application United Kingdom, Oct. 26, 1983, 8328654
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] C09K 3/00
U.S. Cl. 252—186.23 14 Claims

1. A composition suitable for use in bleaching or disinfection comprising an emulsion of an enol ester activator having either of the following general formulae:



(i)

or



(ii)

in which

each of R^a and R^b represent hydrogen or a C_1 to C_5 alkyl radical or a C_2 to C_4 alkenyl radical or a phenyl radical, R^a and R^b being the same or different or combining together to form a carbocyclic di-radical,

R^c represents hydrogen or a C_1 to C_5 alkyl radical or a phenyl radical or is combined with R^a or R^b and the olefin group to form a carbocyclic radical,

R^e represents hydrogen or a C_1 to C_8 alkyl radical or a phenyl radical,

n is 1 or 2,

when n=1, R^d represents hydrogen or a C_1 to C_8 alkyl radical or a phenyl radical,

when n=2, R^d represents a C_2 to C_{10} alkylene di-radical or a phenylene di-radical,

and m is an integer from 0 to 8, together with at least its own weight of a water-soluble emulsifier in an aqueous acidic solution of hydrogen peroxide.

4,613,453
COMPENSATORY PROCEDURE FOR PREPARING HALOAPATITE PHOSPHORS

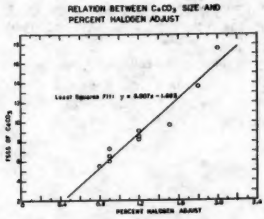
Charles F. Chenot, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

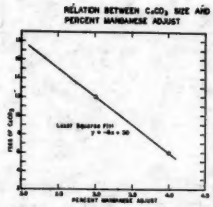
Continuation of Ser. No. 378,367, May 14, 1982, abandoned.
This application Sep. 6, 1985, Ser. No. 773,271
Int. Cl.[4] C09K 11/453
U.S. Cl. 252—301.6 P 1 Claim

1. A method of making a cool white alkaline earth haloapatite phosphor from reactants consisting of $CaHPO_4$, $CaCO_3$ in the calcite form, CaF_2, NH_4Cl, $MnCO_3$, Sb_2O_3 and CdO wherein the respective ratios of said reactants in the fundamental formula of said cool white phosphor are:

3.00:1.242:0.438:0.180:0.087:0.0355:0.053, comprising forming a mixture of said reactants and firing the resultant mixture; said mixture being formed by choosing $CaCO_3$ in the calcite form, of a particle size that corresponds to an ordinate value in FIGS. 2 or 3, determining a weight fraction halogen adjust A that corresponds to said particle size in FIG. 2, determining a weight fraction manganese adjust B that corresponds to said particle size in FIG. 3 and employing said reactants in the following relative

amounts: (1) $CaHPO_4$, 3.00, (2) $CaCO_3$, 1.242- 0.438A-(0.2) (0.087B) (3) CaF_2, 0.438 (1+A)-(0.8) (0.087B) (4)





NH_4Cl, 0.180 (1+2A) (5) $MnCO_3$, 0.087 (1+B) (6) Sb_2O_3, 0.0355+(0.18/4) (2A) (7) CdO, 0.053.

4,613,454

METAL OXIDE/SILICA SOLS

Bruce A. Keiser, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 509,745, Jun. 30, 1983, Pat. No. 4,563,278. This application Sep. 27, 1984, Ser. No. 655,112

Int. Cl.[4] C04B *35/26;* **B01J** *13/00*

U.S. Cl. 252—313.2 **4 Claims**

1. A method of producing an alkaline colloidal aquenous hydrous metal oxide/silica sol which comprises the steps of:

(a) forming a reaction mixture by mixing an hydrolyzable metal compound with an acidic, substantially ion-free colloidal silica sol which contains at least 5% by weight of silica in the presence of an anionic water-soluble stabilizing compound from the group consisting of anionic water-soluble surfactants and water-soluble carboxylic acid polymers, the presence of the anionic stabilizing compound substantially preventing the formation of metal oxide precipitates, and the amount of hydrolyzable metal compound is sufficient to produce at least 0.5% by weight of metal oxide based upon silica content; and

(b) adjusting the pH of the reaction mixture to between 1.5–2.5; and then

(c) raising the pH of the metal oxide/silica sol obtained in step (b) by adding thereto a water-soluble amine to a pH of at least 8.5 whereby a stable alkaline colloidal aqueous hydrous metal oxide/silica sol is produced.

4,613,455

CERAMIC HEATER AND A METHOD FOR ITS PRODUCTION

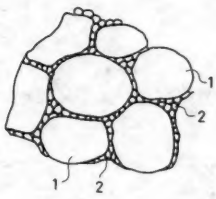
Hirofumi Suzuki, Kariya; Hitoshi Yoshida, and Shunzo Yamaguchi, both of Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 19, 1985, Ser. No. 811,317

Claims priority, application Japan, Sep. 8, 1983, 58-165692

Int. Cl.[4] C04B *35/58;* **H05B** *3/10*

U.S. Cl. 252—516 **5 Claims**



1. A ceramic heater having a heating element composed of a sintered body of powdery mixture consisting essentially of:

from 20 to 90 mol % of silicon nitride powder including a sintering agent selected from the group consisting of yttrium oxide, magnesium oxide, aluminum oxide, silicon dioxide, aluminium magnesium oxide ($MgAl_2O_4$) and a mixture thereof, and

from 10 to 80 mol % of an electrically conductive ceramic powder selected from the group consisting of titanium carbide, titanium nitride and a mixture thereof and having a particle diameter smaller than said silicon nitride powder including said sintering agent, this electrically conductive ceramic powder existing at grain boundaries of the silicon nitride of said sintered body; and

said heater having a resistance controllable within a range of 10^{-3} to 10^3 ohm cm.

4. A method of producing a ceramic heater having a heating element composed of a sintered body, said method comprising the steps of:

(a) preparing a mixture consisting essentially of

(1) from 20 to 90 mol % of silicon nitride powders which are prepared by mixing silicon nitride and a sintering agent selected from the group consisting of yttrium oxide, magnesium oxide, aluminium oxide, silicon dioxide, aluminium magnesium oxide ($MgAl_2O_4$ and a mixture thereof and calcining into a solid solution, and

(2) from 10 to 80 mol % of an electrically conductive ceramic powder selected from the group consisting of titanium carbide, titanium nitride and a mixture thereof and having a particle diameter smaller than that of said silicon nitride powder in the solid solution,

(b) forming the mixture of step (a) into the shape of the desired sintered body; and

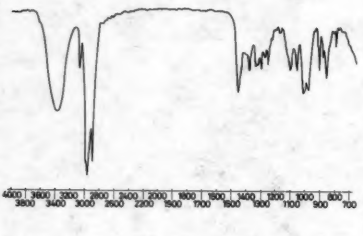
(c) heating and sintering the shape of step (b) in a non-oxidizing inert or nitrogen atmosphere to produce a sintered body in which the electrically conductive powder exists at the grain boundaries of the silicon nitride, said sintered body having a resistance controllable within a range of 10^{-3} to 10^3 ohm cm.

4,613,456

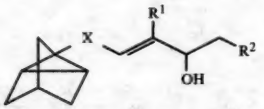
TRICYCLO[2.2.1.0^{2,6}]HEPTANE DERIVATIVES, PROCESS FOR PREPARING SAME, AND PERFUME COMPOSITIONS CONTAINING SAME

Mitsuo Matsuno, Kawasaki; Teraki Yamanashi, Yokohama; Hitoshi Yuasa, Yokohama, and Hirosuke Imai, Yokohama, all of Japan, assignors to Nippon Oil Co. Ltd., Japan

Filed May 17, 1985, Ser. No. 735,341
Claims priority, application Japan, May 18, 1984, 59-98634
Int. Cl.[4] C11B *9/00;* A61K *7/46*
U.S. Cl. 252—522 R 7 Claims



1. A tricyclo[2.2.1.0^{2,6}]heptane derivative of the general formula



(I)

where X represents —CH_2CH_2— or

and R^1 and R^2 independently represent hydrogen or methyl.

4,613,457

2-METHYL PENTANOIC ACID ESTERS AND PERFUME COMPOSITIONS CONTAINING THEM

Siegfried Blösl, Duesseldorf; Klaüs Bruns, Krefeld-Traar, and Ulf-Armin Schaper, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,340
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306560
Int. Cl.[4] A61K *7/46;* C07C *69/02*
U.S. Cl. 252—522 R 6 Claims

1. A method of perfuming a product in need thereof comprising adding to the product from about 0.05 to about 2% by weight of 2-methyl pentanoic acid-2-phenyl-2-propenyl ester.

2. A method of perfuming a product in need thereof comprising adding to the product from about 0.05 to about 2% by weight of 2-methyl pentanoic acid isophoryl ester.

5. 2-methyl pentanoic acid-3-phenyl-2-propenyl ester.

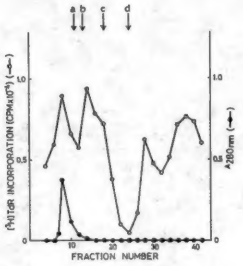
6. 2-methyl pentanoic acid isophoryl ester.

4,613,458

REGULATORY SUBSTANCE OF DNA SYNTHESIS

Yasuji Okai, Machida, Japan, assignor to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00029, § 371 Date Sep. 26, 1984, § 102(e) Date Sep. 26, 1984, PCT Pub. No. WO84/03104, PCT Pub. Date Aug. 16, 1984
PCT Filed Feb. 1, 1984, Ser. No. 662,287
Claims priority, application Japan, Feb. 2, 1983, 58-15790
Int. Cl.[4] C07K *15/06*
U.S. Cl. 530—351 9 Claims



1. A regulatory substance of T cell synthesis which inhibits DNA synthesis of T cells, said substance being a protein which has the following physicochemical properties:

Elementary analysis:Having the elements C, H, O, N and S

Molecular weight:About 1,000 daltons

Thermostability:Stable the several months at −20° C., for 30 minutes to 1 hour at 56° C., and for 30 minutes at 100° C.

Distinction on acidic, basic or neutral properties:Weakly basic

pH stability:Stable at pH 3.5–10.0

Ultraviolet spectrum:Maximum absorption at 210–220 nm

Color reaction:Ninhydrin positive

Solubility in solvents:Readily soluble in water, ethanol and methanol

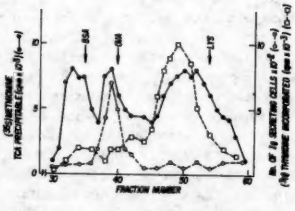
Color of substance:Colorless in water, ethanol and methanol.

4,613,459

LYMPHOCYTE GROWTH FACTOR

Harvey I. Cantor, Boston, and Gary Nabel, Cambridge, both of Mass., assignors to Dana-Farber Cancer Institute, Boston, Mass.

Filed Oct. 20, 1982, Ser. No. 435,510
Int. Cl.[4] C07K *3/28;* C12N *5/00, 5/02, 1/38*
U.S. Cl. 530—351 13 Claims



1. A mammalian growth factor produced by

(a) isolating mammalian inducer T lymphocytes having the characteristics of clone Cl. Ly1$^+$2$^-$/9,

(b) stimulating growth factor production in said lymphocytes by contacting said inducer lymphocytes with an antigen or mitogen, and

(c) isolating at least one growth factor from the material produced by the stimulated lymphocytes,

said growth factor being selected from a growth factor for B- and T-cell lymphocytes having a molecular weight of about 14 kilodaltons, a growth factor for B-cell lymphocytes, and a growth factor for mast cells.

4,613,460

PROCESS FOR PREPARING α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Paolo Casati, Monza; Biagio Elefante, Gorgonzola, and Claudio Fuganti, Milan, all of Italy, assignors to DE.BI Derivati Biologici International S.p.A., Milan, Italy

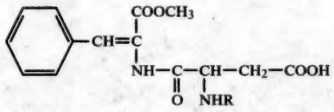
Filed Oct. 16, 1984, Ser. No. 661,390

Claims priority, application Italy, Jan. 13, 1984, 19141 A/84

Int. Cl.⁴ C07K *5/06*

U.S. Cl. 560—41 **2 Claims**

1. The compound methyl N(α-L-aspartyl)α-aminocinnamate protected at the nitrogen, of formula



(III)

where R is a protector group at the nitrogen.

4,613,461

PROCESS FOR PREPARING ESTERS OF THIOLCARBAMIC ACIDS

Péter Viski; László Simándi; Ferenc Nagy; Gábor Besenyei, all of Budapest; György Pászthy; Gyula Pázmándi, both of Kazincbarcika; István Szita; Gyula Szilágyi, both of Miskolc; István Tóth, and Ilona Szigeti née Kiss, both of Budapest, all of Hungary, assignors to MTA Kozponti Kemiai Kutato Intezet, Budapest and Borsodi Vegyi Kombinat, Kazincbarcika, both of, Hungary

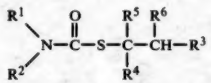
Filed Dec. 31, 1984, Ser. No. 687,608

Claims priority, application Hungary, Dec. 29, 1983, 4509/83; Dec. 29, 1983, 4510/83; Dec. 10, 1984, 4583/84; Dec. 10, 1984, 4584/84

Int. Cl.⁴ C07D *211/60, 207/00;* **C07C** *153/00, 154/00*

U.S. Cl. 540—608 **18 Claims**

1. A process for the preparation of a thiolcarbamate ester of the formula (I)



(I)

wherein

R^1 and R^2 stand independently for hydrogen or a straight or branched chain alkyl group containing 1 to 6 carbon atoms or an alkenyl group containing 2 to 6 carbon atoms, or an alkyl group containing 1 to 6 or alkenyl group containing 2 to 6 carbon atoms and mono- or polysubstituted by halogen, oxygen, sulphur and/or nitrogen; or

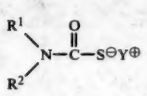
R^1 and R^2 together can represent an optionally substituted β,ω-alkylene group containing 4 to 6 carbon atoms;

R^3 and R^4 stand independently for hydrogen or an alkyl group containing 1 to 4 carbon atoms and optionally substituted by halogen or by a group containing oxygen, sulphur and/or nitrogen; and

R^5 and R^6 both stand for hydrogen; or

R^5 and R^6 together can represent a chemical bond, which comprises reacting

(a) thiolcarbamate salts of the formula (II)



(II)

wherein,

Y stands for a primary, secondary or tertiary ammonium ion or an alkaline metal ion; or

(b) amines of the formula (III)

(III)

together with sulphur and carbon monoxide; or

(c) amines of the formula (III) together with carbonyl sulphide and with an alkyne of the formula (IV)

(IV)

and, hydrogenating the obtained product of formula (I), wherein of R^5 together with R^6 forms a chemical bond, to a compound of the formula (I), wherein both R^5 and R^6 stand for hydrogen.

4,613,462

6-SUBSTITUTED PENICILLANIC ACID 1,1-DIOXIDE COMPOUNDS

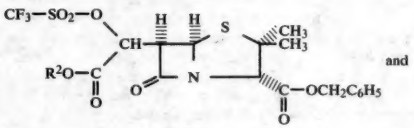
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer, Inc., New York, N.Y.

Division of Ser. No. 751,331, Jul. 2, 1985, Pat. No. 4,590,073, which is a continuation-in-part of Ser. No. 663,910, Oct. 22, 1984, abandoned. This application Feb. 6, 1986, Ser. No. 826,715

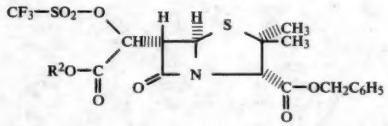
Int. Cl.⁴ C07D *499/00;* **A61K** *31/425*

U.S. Cl. 540—310 **5 Claims**

1. A compound selected from the group consisting of



and



wherein R^2 is selected from the group consisting of alkyl having 1 to 4 carbons and benzyl.

4,613,463

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF 17 ALPHAHYDROXYPROGESTERONES AND CORTICOIDS FROM AN ENOL STEROID

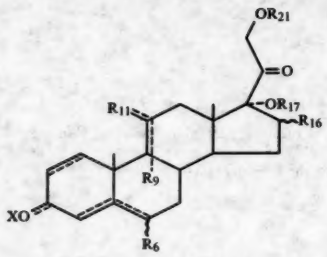
Clifford E. Sacks, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 1, 1984, Ser. No. 667,023

Int. Cl.⁴ C07J *21/00*

U.S. Cl. 540—94 **20 Claims**

1. A process for the preparation of a 17-substituted steroid of the formula:


(III A, B, C)

and C_3 protected forms thereof, where X is a hydrogen atom or nothing, when X is nothing, the ------ at C_3 is a double bond, when X is a hydrogen atom the ------ at C_3 is a single bond; R_6 is a hydrogen, chlorine, fluorine or bromine atom, or methyl group; R_9 is nothing, a hydrogen, chlorine, fluorine, bromine or oxygen atom which makes the C-ring

(a) $\Delta^{9(11)}$ when R_9 is nothing

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are oxygen atom;

R_{11} is a hydrogen, chlorine, bromine, fluorine or oxygen atom, two hydrogen atoms or α- or β-hydroxyl group which makes the C-ring

(a) $\Delta^{9(11)}$ when R_{11} is a hydrogen atom,

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are oxygen atom and ------ between C_{11} and R_{11} is a single bond;

R_{16} is either a hydrogen atom, a hydroxyl or methyl group; R_{17} either a hydrogen or

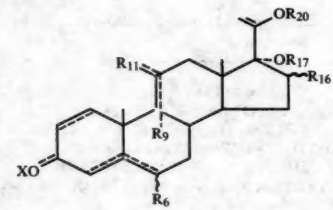
group where Z is alkyl of 1 to 4 carbon atoms, phenyl, or phenyl substituted with alkyl of one thru four carbon atoms, or substituted with one thru three nitro groups, substituted with one thru three trifluoromethyl groups or substituted with one thru three halogen atoms, with the proviso that R_{16} and R_{17} can be taken together to form the acetonide;

R_{21} a hydrogen atom, alkyl carboxylate of 2 thru 6 carbon atoms, alkyl dicarboxylate of 2 thru 6 carbon atoms or aromatic carboxylate of 7 thru 12 carbon atoms;

------ is a single or double bond; ~ indicates that the attached atom or group can be in either the α or β configuration; and the ------ indicates the attached group is in the α configuration;

which comprises

(1) contacting a 17α-substituted steroid of the formula (or a C_3 protected form thereof)


(I A, B, C)

where X, R_6, R_9, R_{11}, R_{16}, R_{17}, ------, ~, ------ are defined above and R_{20} is alkyl one thru 5 carbon atoms, phenyl or phenyl substituted with one alkyl of thru 4 carbon atoms or alkoxy of one thru 3 carbon atoms; with a peroxymonosulfate ion, in a biphasic reaction medium that is phase transfer catalyzed and contains a ketone;

(2) and reacting the product of step 1 with an acid.

4,613,464

PROCESS FOR THE PREPARATION OF ANTHRACYCLINONES

Karsten Krohn, Brunswick, and Bert Behnke, Ahrensburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

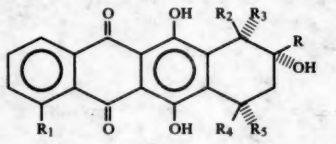
Filed Aug. 10, 1984, Ser. No. 639,311

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329185

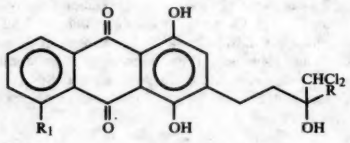
Int. Cl.[4] C07C *49/423, 50/22, 50/24*

U.S. Cl. 260—384 **5 Claims**

1. A process for the preparation of a compound of the formula I

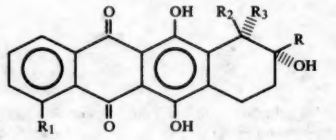

I

in which R denotes C_1–C_4-alkyl, R_1 denotes hydrogen or hydroxyl, R_2 and R_3 differ from one another and each denote hydrogen or hydroxyl, and R_4 and R_5 like from one another and denote hydrogen or hydroxyl, which process comprises taking a compound of the formula


II

in which R and R_1 have the above-mentioned meaning, and either

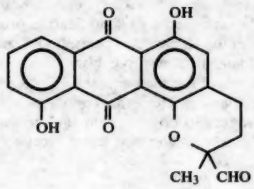
(a) where R_1 denotes hydrogen, reacting it with an alkali metal hydroxide solution with the addition of a reduction agent at 0° C. and then oxidizing the resulting product with air and acidifying, whereupon a compound of the formula III


III

in which R_1 denotes hydrogen and R, R_2 and R_3 have the above-mentioned meaning, is obtained or

(b) where R_1 denotes the OH group, reacting it in a phase-transfer reaction with an alkali metal hydroxide solution in a chlorinated hydrocarbon, with the addition of tetrabutylammonium hydrogen sulfate, followed by reduction with a reducing agent at 0° C. to give a compound of the formula III, in which R_1 denotes the OH group and R_1, R_2 and R_3 have the above-mentioned meaning, or

(c) where R_1 denotes the OH group and R denotes CH_3, reacting it with an alkali metal methanolate at room temperature under an inert gas to give a compound of the formula IV



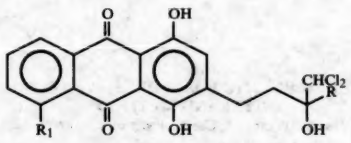
IV

and converting the resulting cyclic aldehyde, by reaction with a reducing agent at 0° C. followed by oxidation with air and acidification, into a compound of the formula III, in which R denotes CH_3, R_1 denotes the OH group and R_2 and R_3 have the above-mentioned meaning, and

(d) converting a compound of the formula III, in which R, R_1 and R_3 have the above-mentioned meaning, and R_2 denotes the OH group by esterification with hexafluoroacidic anhydride into a compound of the formula III, in which R_2 represents the $-OCOCF_3$ radical, and

(e) brominating a compound of the formula III, in which R and R_1 have the above-mentioned meaning, R_3 represents hydrogen and R_2 represents the $-OCOCF_3$ radical, and then carrying out hydrolysis to give a compound of the formula I.

3. A compound of the formula II



II

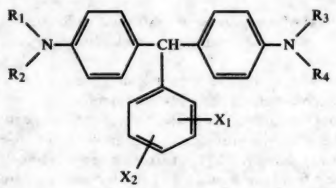
in which R represents C_1–C_4-alkyl and R_1 represents hydrogen or hydroxyl.

4,613,465
TRIPHENYL METHANE DERIVATIVES AND METHOD OF QUANTITATIVELY MEASURING AN OXIDATIVE SUBSTANCE

Kazuhiko Yamanishi; Akinori Shintani; Satoru Okajima, and Toshiro Hanada, all of Tokyo, Japan, assignors to Wako Pure Chemical Industries Ltd., Osaka, Japan

Filed Sep. 11, 1984, Ser. No. 649,477
Claims priority, application Japan, Mar. 2, 1984, 59-40031
Int. Cl.[3] C09B *11/10*
U.S. Cl. 260—394 **4 Claims**

1. A triphenyl methane derivative represented by the general formula (I):



(I)

wherein R_1, R_2, R_3 and R_4, which may be the same as or different from one another, represent lower alkyl groups, and X_1 and X_2 both represent $-O(CH_2)_nSO_3M$ in which M is a hydrogen atom, an alkali metal ion or NH_4^+, and n is an integer of 2–4, or either of X_1 and X_2 represents $-O(CH_2)_nSO_3M$ in which M and n are the same meanings as given above and the other represents a hydrogen atom.

4,613,466
PREPARATION OF HEXAMETHYLENE 1,6-DIISOCYANATE AND/OR ISOMERIC DIISOCYANATES WHERE ALKYLENE IS OF 6 CARBON ATOMS

Franz Merger, Frankenthal; Gerhard Nestler; Friedrich Towae, both of Ludwigshafen, and Hans Hellbach, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 515,896, Jul. 21, 1983, abandoned. This application Jul. 15, 1985, Ser. No. 754,751
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227748; Dec. 24, 1982, 3248018
Int. Cl.[4] C07C *141/00*
U.S. Cl. 560—344 **9 Claims**

1. A process for the preparation of hexamethylene 1,6-diisocyanate and isomeric aliphatic diisocyanates where the alkylene is of 6 carbons by thermal cleavage of the corresponding dialkylurethanes, which comprises:

(a) vaporizing said dialkylurethanes, without decomposition, at from 220° to 300° C. in a vaporizer,

(b) passing the resulting vapors into a reactor provided with a packing material selected from the group consisting of brass, zinc, and zinc alloyed with nickel and copper,

(c) thermally cleaving said vaporous dialkylurethanes in the packed reactor at a temperature above 300° C. under a reduced pressure, and

(d) causing the vapors produced in the cleavage reaction to be fractionally condensed.

4,613,467
FLUOROSULFONYLPERFLUOROALKYL COMPOUNDS

Kyoji Kimoto, Kanagawa; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Kanagawa; Mikio Ebisawa, Kanagawa, and Toshioki Hane, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 330,608, Dec. 14, 1981, Pat. No. 4,536,352, which is a continuation of Ser. No. 152,856, May 23, 1980, Pat. No. 4,329,435. This application Aug. 30, 1983, Ser. No. 527,746
Claims priority, application Japan, May 31, 1979, 54-67889; Jul. 18, 1979, 54-90302; Dec. 21, 1979, 54-165675; Dec. 26, 1979, 54-168179; Dec. 28, 1979, 54-170315
Int. Cl.[4] C07C *143/70*
U.S. Cl. 260—543 F **4 Claims**

1. A fluorinated carboxylic acid or its derivative represented by the formula:

$$FSO_2(CF_2)_nY$$

wherein Y is $-COY^1$ or $-CN$, Y^1 being halogen, hydrogen, $-NH_2$, $-OM$, wherein M is a member selected from the group consisting of hydrogen, a metal and ammonium, or $-OR^1$, wherein R^1 is a member selected from the group consisting of C_1–C_{10} alkyl and aryl; and n is an integer of 2 to 4.

4,613,468
METHOD FOR PREPARING AROMATIC AND OLEFINIC ORGANOSELENIUM AND ORGANOTELLURIUM COMPOUNDS

Daniel J. Sandman, Acton; James C. Stark, Quincy, and Lewis A. Acampora, Cambridge, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 12, 1984, Ser. No. 570,169
Int. Cl.[4] C07C *163/00, 165/00*
U.S. Cl. 260—550 **22 Claims**

1. A method of preparing aromatic organic telluride compounds comprising:

reacting elemental tellurium with an alkali metal trialkyl-

borohydride in a solvent to produce a tellurium reagent and;

reacting said tellurium reagent with a carbocyclic aromatic halide having no strong electron withdrawing group other than a halogen on the halogenated ring or on a ring adjacent to the halogenated ring, in a reaction solution consisting of the tellurium reagent and the aromatic halide in a solvent, to form a carbocyclic aromatic organic telluride compound.

4,613,469

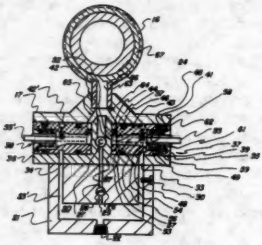
CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Rex W. Peterson, 3028 Navajo La., Provo, Utah 84604

Filed Jan. 23, 1984, Ser. No. 573,104

Int. Cl.[4] F02M *7/04*

U.S. Cl. 261—41 B **7 Claims**



1. A carburetor for an internal combustion engine which includes a source of fuel and combustion chambers, said carburetor including a body surrounding an air passage, a venturi section in said air passage and throttle means for controlling the passage of air through said air passage, said carburetor further comprising

a primary fuel circuit having a first metering valve for introducing fuel from the fuel source directly into the air passage to produce a relatively lean fuel-to-air mixture,

first operating means for operating the first metering valve in conjunction with said throttle means whereby each incremental movement of the throttle means produces a proportional incremental operation of said first metering valve,

a secondary fuel circuit having a second metering valve for introducing additonal fuel from the fuel source directly into the air passage for enriching the fuel-to-air mixture, and

second operating means for operating the second metering valve in conjunction with the air pressure in the venturi section in said air passage, said second operating means being adapted to be responsive to the air pressure in said venturi section and to produce a proportional incremental operation of said second metering valve in response to incremental changes in the air pressure in said venturi section.

4,613,470

IN LINE PROCESS FOR SEQUENTIALLY FORMING AND SHAPING A FILAMENT

Sebastian Aftalion, 122 Telford Road, East Kilbride, Glasgow, Scotland G75 OBX

Filed Jun. 6, 1984, Ser. No. 617,622

Claims priority, application United Kingdom, Jun. 6, 1983, 8315426

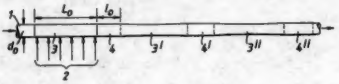
Int. Cl.[4] B29C *35/10*; **D01D** *5/20*

U.S. Cl. 264—22 **8 Claims**

1. An in line process for sequentially forming and shaping a filament, comprising spinnning the filament in a fluid state at a uniform rate from a nozzle, drawing out the spun filament and allowing the drawn filament to solidify; including the steps of:

drawing the filament during its solidification process past a source of rapidly fluctuating energy flux and thereby causing the filament to absorb energy in varying amounts along the length of the filament, and

stretching the filament after the energy absorption step whereby to reduce its cross-section and form intermittent zones of relatively greater and lesser cross-section along



its length, the zones of different cross-section corresponding to regions of the filament that were exposed to different amounts of energy;

the fluctuations in the energy flux and the stretching of the exposed filament being selected to produce cross-sectional area ratios between the zones of relatively greater and lesser cross-section of at least 1:0.8 and a frequency of cross-sectional change of at least one per millimeter over at least part of the length of the solidified stretched filament.

4,613,471

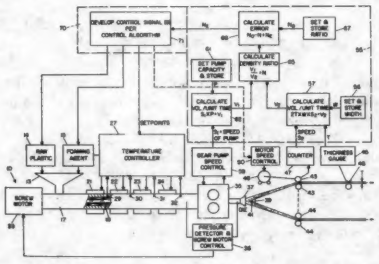
EXTRUDED PLASTIC FOAM DENSITY CONTROL SYSTEM AND METHOD

Holton E. Harris, Westport, Conn., assignor to Harrel, Incorporated, East Norwalk, Conn.

Filed Jul. 16, 1984, Ser. No. 630,956

Int. Cl.[4] B29C *47/92, 67/22, 47/02*

U.S. Cl. 264—40.1 **48 Claims**



1. A method of controlling the extrusion of foamed extrudate in an extrusion line having an extruder including the steps of:

measuring at least one characteristic of the foamed extrudate that is dependent on the density thereof,

controlling the flow of the unfoamed melt in the extruder to provide a known volume per unit time of the unfoamed melt being delivered to the extrusion end of the extruder,

developing from the measured characteristic of the foamed extrudate and the known volume being delivered to the extrusion end a control value dependent on the density of the foamed extrudate, and

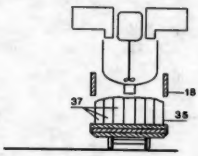
controlling at least one operating characteristic of the extrusion line affecting density of the foamed extrudate based upon the control value.

4,613,472

PROCESS FOR THE MANUFACTURE OF AERATED CONCRETE PRODUCTS

Göte Svanholm, Örebro, Sweden, assignor to Svanholm Engineering AB, Örebro, Sweden

Filed Jan. 20, 1984, Ser. No. 572,545
Claims priority, application Sweden, Jan. 24, 1983, 8300342
Int. Cl.[4] B29C *67/20*; B28B *5/04, 7/26, 7/34*
U.S. Cl. 264—42 30 Claims



1. A method for the manufacture of aerated concrete material, comprising the steps of:
(a) preparing a quick-stiffening mixture of at least one silica containing material, at least one calcareous binder, a rising agent, and water;
(b) pouring the mixture into a mould which is assembled from a plurality of mould elements;
(c) allowing the material in the mould to stiffen during a stiffening time to a semiplastic body;
(d) disassembling the mould and releasing the semiplastic body;
(e) repeating step (a);
(f) pouring the mixture of step (e) into a mould which is assembled from at least one mould element that was used in step (b) and at least one mould element that was not used in step (b), step (f) being conducted a predetermined pacing time after step (b), with the stiffening time always being kept shorter than the pacing time so that said at least one mould element that was used in step (b) can be employed; and
(g) repeating steps (c) and (d).

4,613,473

METHOD FOR FORMING COMPOSITE ARTICLES OF COMPLEX SHAPES

George K. Layden, Wethersfield, and Karl M. Prewo, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 20, 1984, Ser. No. 602,284
Int. Cl.[4] B29C *43/18*; B29B *11/14*
U.S. Cl. 264—103 5 Claims

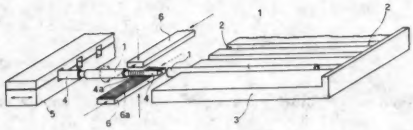
1. A method of making fiber reinforced glass, glass-ceramic or ceramic matrix composite articles particularly adapted to making such articles in complex shapes comprising:
forming a matrix material into matrix fibers,
forming the matrix fibers into matrix yarn,
forming a reinforcing material into reinforcing fibers,
forming the reinforcing fibers into reinforcing yarn,
forming a hybrid cloth of the matrix yarn and the reinforcing yarn, wherein the matrix yarn comprises about 30% to about 70% by volume of the cloth,
cutting a plurality of preforms of predetermined pattern from the hybrid cloth,
forming a stack of the preforms to a predetermined height,
placing the stack in a die, and
applying sufficient heat and pressure to cause the matrix material to flow about the reinforcing fibers forming the composite article.

4,613,474

PROCEDURE AND RELEVANT MECHANICAL APPARATUS TO OBTAIN THE FOLDING SECTION OF A PLASTIC DRINKING STRAW

Gino Donati, Via Carpignola, 64, Cattolica (FO), Italy

Filed Jan. 8, 1985, Ser. No. 689,603
Claims priority, application Italy, Jan. 13, 1984, 602 A/84
Int. Cl.[4] B29C *53/30*
U.S. Cl. 264—320 8 Claims



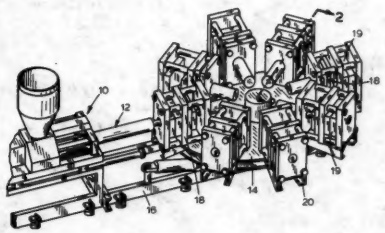
1. A method for forming the folding section of a plastic drinking straw comprising, supporting a plastic straw on a grooved support plate, inserting a freely rotatable piston pin having parallel circular grooves and a point for centering the straw into the plastic straw, lengthwise moving opposed forming bars having lengthwise grooves in facing surfaces, said facing surfaces being complementary to the grooves of the piston pin, and moving the bars orthogonal to the piston pin and in opposite directions at least once while said bars are in contact with a straw positioned on said piston pin thereby causing free rotation of the piston pin and formation of the folding section, retracting the forming bars, and removing the straw from the piston pin.

4,613,475

CLAMPING STRUCTURE AND METHOD FOR CLAMPING THE MOLD UNIT OF A MOLD INJECTION APPARATUS

Siebolt Hettinga, 2123 NW. 111th St., Des Moines, Iowa 50322

Filed Feb. 19, 1985, Ser. No. 702,880
Int. Cl.[4] B29C *45/06, 45/77*
U.S. Cl. 264—328.1 5 Claims



1. A method for uniformly distributing a clamping pressure to a mold comprised of a stationary mold section and a movable mold section to form a sealed mold cavity, wherein said mold sections have coacting perimetric seating portions defining said mold cavity, said movable mold section has a mold face side and an opposite flat side, and the mold clamping force is applied by a linearly extendible and retractable ram member

against the central portion of the flat side of said movable mold section, comprising:

(a) providing a rigid carriage member having a flat side with a surface area greater than the area of the flat side surface of said movable mold section,

(b) rigidly securing the flat side of the carriage member to the flat side of the movable mold section,

(c) interposing a plate unit between the ram member and the carriage member and out of abutting engagement with each of said members when the ram member is retracted, and movable into abutting engagement with the ram member and the carriage member when the ram member is extended to engage the seating portions of said mold sections, and

(d) positioning the plate unit with a flat side adjacent the carriage member having a surface area greater than the area of the flat side surface of the movable mold section, whereby the clamping force of the ram member is transmitted uniformly over the flat side surface of the carriage member for application against the flat side of the movable mold section when the ram member is extended to engage the seating portions of said mold sections.

3. A molding apparatus having a mold unit, said mold unit including a movable mold section and a stationary mold section, each mold section having a mold face side surface and an opposite flat side surface, each of said mold sections further having coacting perimetric seating portions, and a linearly extendible and retractable ram means for moving the movable mold section into and out of a clamped, seating engagement with the stationary mold section; a clamping structure comprising:

(a) a carriage member of a rigid plate form having a flat side with a surface area greater than the area of the flat side surface of said movable section,

(b) means supporting the carriage member for reciprocal movement toward and away from the stationary mold section,

(c) means rigidly securing the flat side of said movable mold section to said flat side of the carriage member, and within the surface area of said flat side,

(d) a plate unit having a flat side with a surface area greater than the flat side surface area of said movable mold section, and less than the flat side surface area of said carriage member, and

(e) means supporting the plate unit between and in a lost motion connection with the carriage member and the rams means when the ram means is in a retracted position therefor and said movable mold section being located within the surface area of said plate unit, whereby the mold clamping force of the ram means, on extension thereof to seat said mold sections, is uniformly distributed in a pyramidal pattern throughout said plate unit and carriage member for application against said movable mold section.

4,613,476

RADIATION ATTENUATING FLUID WORK ENVIRONMENT

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Filed May 10, 1982, Ser. No. 376,611
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—249 **25 Claims**

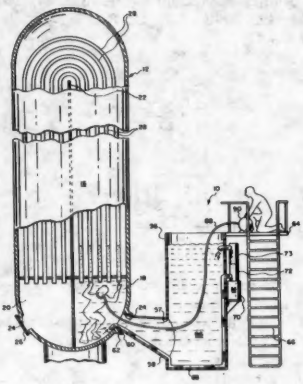
1. A method for inspection and repair of a radioactive environment comprising:

providing a substantially enclosed radioactive workspace having at least one entrance portal, said workspace being a portion of said radioactive environment;

providing a separate liquid receiving work tank having a first opening through which workers can enter and exit said tank, said work tank being separate from said radioactive environment;

physically attaching and sealingly coupling said tank to said entrance portal through a second opening in said tank to provide a passageway for the workers between said tank and said enclosed workspace;

filling said tank and said workspace through said passageway and said portal with a radiation attenuating liquid; and



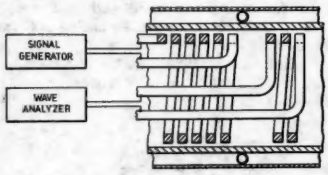
confining said liquid to said tank, said passageway and said workspace to provide a liquid radiation attenuating medium for the workers to pass into and out of and work in said liquid filled workspace.

4,613,477

METHOD OF REPOSITIONING ANNULAR SPACERS IN CALANDRIA STRUCTURES AND APPARATUS THEREFOR

Joseph H. Dableh, 806 Queensbridge Dr., Mississauga, Ontario, Canada L5C 3K4

Filed Mar. 22, 1984, Ser. No. 591,907
Claims priority, application Canada, Dec. 12, 1983, 443096
Int. Cl.[4] G21C *17/00, 19/00*
U.S. Cl. 376—258 **14 Claims**



1. In a fluid-cooled nuclear reactor having a calandria comprising an array of longitudinally extending calandria tubes each housing a coolant tube extending coaxially therethrough, each coolant tube being spaced from its associated calandria tube by annular spacers seated therebetween, a method of repositioning a selected one of said spacers in situ by displacing it longitudinally from an initial position to a required position, which method comprises advancing an electromagnetic coil interiorly along the coolant tube to a position adjacent the spacer and passing a varying electric current through the coil, the position of the coil relative to the spacer and the magnitude and rate of change of current being such as to exert an electromagnetic repulsive force on the spacer in the direction of the required displacement and sufficient to overcome static friction at the seating of the spacer between the tubes.

4,613,478

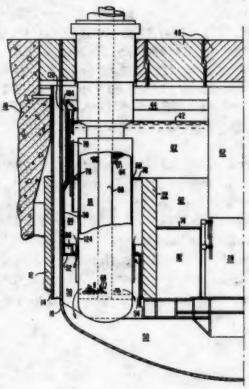
PLENUM SEPARATOR SYSTEM FOR POOL-TYPE NUCLEAR REACTORS

John E. Sharbaugh, Bullskin Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 192,145, Sep. 29, 1980, abandoned, which is a continuation of Ser. No. 938,628, Aug. 31, 1978, abandoned. This application Jan. 11, 1984, Ser. No. 569,930

Int. Cl.[4] G21C *11/08*

U.S. Cl. 376—290 2 Claims



1. A pool-type liquid-metal-heat-transfer nuclear reactor comprising:

a vertically disposed generally cylindrical reactor vessel having a closed bottom portion, and a closure head atop said reactor vessel and closing said reactor vessel;

said reactor vessel enclosing the major components of said nuclear reactor which include a reactor core supported at a centrally disposed lower portion of said reactor vessel, a core barrel radially bounding fuel assemblies and comprising said reactor core, liquid metal pumps having intakes and also having outlets which connect to conduits which feed liquid metal into the bottom of said reactor core to pump liquid metal upwardly therethrough to heat said liquid metal, heat exchangers having heated liquid-metal intakes and cooled liquid-metal discharges and operable to transfer heat from said core-heated liquid metal to another heat-transfer medium for the transfer of generated heat from said reactor, a space immediately underneath said closure head which comprises a cover gas space and encloses inert gas, and said reactor-vessel-enclosed major reactor components immersed in said heat-transfer liquid metal;

a bottom-supported gas-plenum-forming hollow cylindrical member closed at its upper end, said hollow cylindrical member sealed to and supported by said reactor vessel and extending upwardly and in inwardly spaced relationship with respect to said reactor vessel and into but not through said gas cover space to form with said reactor vessel an elongated annular-conformed gas plenum in gaseous communication with said gas cover space, and means for removing heat from said annular gas plenum and for cooling the upper portion of said cylindrical member to condense liquid-metal vapor from the atmosphere thereabout to substantially prevent liquid-metal condensation in said annular gas plenum;

a hollow cylindrically conformed neutron shield member spaced from and radially surrounding said reactor core;

separate liquid-metal plena confining liquid metal during normal reactor operation and comprising a hot upper plenum, a cold lower plenum and intermediate temperature plena; said intermediate temperature plena being positioned so as to separate said hot upper plenum from said cold lower plenum; upper structural members extending from the top portion of said reactor core barrel to said neutron shield member and from said neutron shield member to said gas-plenum-forming cylindrical member and together with said gas cover space defining the boundaries of said hot upper plenum; lower structural members extending from the bottom portion of said reactor core barrel to said reactor vessel and together with said reactor vessel and said closed bottom portion thereof defining the boundaries of said cold lower plenum; and the boundaries of said intermediate temperature plena are defined by said reactor core barrel, said upper structural members, portions of said neutron shield and said lower structural members, and one of said intermediate temperature plena formed in part by the lower portion of said gas-plenum-forming cylindrical member;

the liquid metal intakes of said liquid metal pumps positioned in said cold lower plenum with the cooler liquid metal therein being pumped upwardly through said reactor core to be heated and exit therefrom in a turbulent fashion;

the liquid metal intakes of said heat exchangers positioned within said hot upper plenum and the liquid metal discharges of said heat exchangers positioned within said cold lower plenum to discharge cooled liquid metal into said cold lower plenum; and

the liquid metal contained in said intermediate temperature plena being substantially stagnant and thermally stratified to grade the temperature differential between the liquid metal in said hot upper plenum and the liquid metal in said cold lower plenum; whereby the temperature differential conditions existing between said hot upper plenum and said cold lower plenum are graded by said intermediate temperature plena and hot liquid metal in said hot upper plenum is insulated from said reactor vessel by said annular gas plenum; said bottom-supported hollow cylindrical member having inner and outer walls defining an annular space therebetween, a cylindrical flow baffle extending between said inner and outer walls of said bottom-supported hollow cylindrical member, said cylindrical flow baffle being spaced from said inner wall and said outer wall and extending substantially the height of said bottom-supported hollow cylindrical member, and during normal reaction operation a relatively small volume of said liquid metal is pumped by said liquid metal pumps from said cold lower plenum and upwardly through the space between said outer wall and said cylindrical flow baffle and then downwardly through the space between said inner wall and said cylindrical flow baffle and thence to return to said intermediate-temperature plenum to cool said elongated annular gas plenum and the top portion of said hollow cylindrical member.

4,613,479

WATER REACTOR FUEL CLADDING

John P. Foster, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1984, Ser. No. 589,296

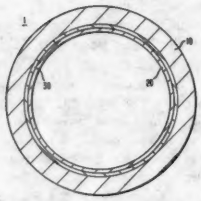
Int. Cl.[4] G21C *3/00*

U.S. Cl. 376—416 10 Claims

1. A nuclear fuel element cladding tube comprising:

concentric tubular layers including a wrought niobium base material layer inside of an outermost layer;

said outermost layer, metallurgically bonded to said wrought niobium base material layer by coextrusion;
said outermost layer composed of a zirconium base alloy characterized by excellent resistance to corrosion caused by exposure to high temperature and pressure aqueous environments;
said wrought niobium base material layer consisting essentially of up to about 59 w/o zirconium, up to about 0.25 w/o tantalum, up to about 300 ppm of oxygen and the balance being essentially niobium;
and said wrought niobium base material layer having a wall thickness of at least 3 mils and characterized by improved resistance to crack propagation under reactor operating conditions compared to said zirconium alloy.



4,613,480
TRI-NICKEL ALUMINIDE COMPOSITION PROCESSING TO INCREASE STRENGTH
Keh-Minn Chang, Schenectady; Shyh-Chin Huang, Latham, and Alan I. Taub, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 3, 1985, Ser. No. 783,581
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—30 **11 Claims**

1. A method of improving the room temperature properties of a tri-nickel aluminide base composition which comprises preparing a melt of a boron doped tri-nickel aluminide according to the expression

$$[(Ni_{1-a}M_a)_{1-x}(Al_{1-b}\overline{M}_b)_x]_{100-y}B_y$$

where
M is a substituent metal for nickel;
a has a value between 0.0 and 0.30;
$\overline{M}$ is a substituent for aluminum;
b has a value between 0.0 and 0.10;
x has a value between 0.23 and 0.25; and
y has a value between 0.2 and 1.50,
atomizing the melt to rapidly solidify the melt to powder particles having Ll_1 type crystal structure,
forming a consolidated body of said particles to retain the Ll_2 type crystal structure, and
cold working the body to deform it by more than 5%.

4,613,481
MERCAPTHOTHIAZOLINE CORROSION INHIBITING COMPOSITIONS
Jasbir S. Gill, Coraopolis, and Arthur J. Friedman, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.
Filed Aug. 16, 1985, Ser. No. 766,389
Int. Cl.[4] C09K *3/00*
U.S. Cl. 422—16 **9 Claims**

1. A composition useful for inhibiting the corrosion of copper and copper alloys in an aqueous system comprising mercaptothiazoline and ferrous ion.

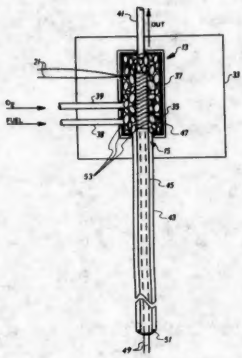
4. The composition of claim 1, wherein said ferrous ion is provided by $K_4Fe(CN)_6.3H_2O$.

5. The method of inhibiting the corrosion of copper and copper alloys in an aqueous system comprising maintaining in the aqueous system at least about 1 ppm of mercaptothiazoline.

4,613,482
CONSTANT TEMPERATURE HEATING VALUE MEASUREMENT APPARATUS
M. Charles Cheney, Norfolk, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Filed Dec. 23, 1983, Ser. No. 564,791
Int. Cl.[4] G01N *25/22*
U.S. Cl. 422—51 **18 Claims**

1. Apparatus for measuring the heating value of a fuel gas, when combusted with an oxidizer gas, comprising:
a combustion unit, including
an outer shell having a high coefficient of thermal conductivity, defining an inner combustion chamber,
a fuel gas conduit communicating with said combustion chamber to provide a fuel gas thereby,
an oxidizer gas conduit communicating with said combustion chamber to provide an oxidizer gas thereby,
a heating element within said combustion chamber for raising the temperature of said combustion chamber above the combustion temperature of said fuel gas;
means for supplying energy to the heating element;
means within said combustion chamber defining a path for conducting and mixing said fuel gas with said oxidizer gas to achieve substantially complete combustion of said fuel gas with said oxidizer gas within the combustion chamber, and for transmitting substantially the total heating effects within said combustion chamber to said outer shell;
means for sensing the temperature of the outer shell and producing an output signal corresponding to the temperature of the outer shell;
means, responsive to said temperature output signal, for maintaining the temperature of the shell constant; and

means, in communication with said temperature maintaining means, for relating the response of said temperature maintaining means to a measure of the heating value of said fuel gas.



9. A method for reducing polymer build-up on the internal surfaces of a polymerization reaction vessel exposed to aqueous polymerization reaction mixtures of vinylidene monomers, comprising applying on said internal surfaces of the polymerization vessel exposed to contact with the polymerization reaction mixtures, prior to adding the polymerization reaction mixture to the polymerization vessel, a coating of material comprising anionic, water-soluble carboxyl-containing copolymers selected from the group consisting of (1) copolymers containing about 30 to about 80 mole percent of residues equivalent to olefinically unsaturated monocarboxylic acids and about 70 to about 30 mole percent of residues equivalent to at least one copolymerizable vinylidene comonomer having at least one terminal $>CH_2$ group, and (2) copolymers containing about 50 mole percent of residues equivalent to olefinically unsaturated dicarboxylic acids and about 50 mole percent of residues equivalent to at least one copolymerizable vinylidene comonomer having at least one terminal $>CH_2$ group, and drying said coating, said coating being at least about 0.1 micron in thickness.

15. A method for polymerizing vinyl chloride, optionally with other vinylidene comonomers copolymerizable therewith, in a polymerization vessel in an aqueous media, in the presence of a free radical forming catalyst, comprising, before adding the polymerization materials to the polymerization vessel, coating the internal surfaces of the polymerization vessel exposed to the polymerization materials during the polymerization reaction with a coating material comprising an anionic, water-soluble carboxyl-containing copolymer selected from the group consisting of (1) copolymers containing about 30 to about 80 mole percent of residues equivalent to olefinically unsaturated monocarboxylic acids and about 70 to about 30 mole percent of residues equivalent to at least one copolymerizable vinylidene comonomer having at least one terminal $>CH_2$ group, and (2) copolymers containing about 50 mole percent of residues equivalent to olefinically unsaturated dicarboxylic acids and about 50 mole percent of residues equivalent to at least one copolymerizable vinylidene comonomer having at least one terminal $>CH_2$ group, and drying said coating, said coating being at least about 0.1 micron in thickness.

4,613,483

COATED POLYMERIZATION VESSELS AND METHODS FOR USE THEREOF

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 7, 1984, Ser. No. 669,166
Int. Cl.[4] C08F *2/00*
U.S. Cl. 422—131 **22 Claims**

1. A polymerization reaction vessel having the internal surfaces thereof that are exposed to an aqueous polymerization reaction mixture of vinylidene monomers coated with a dried anionic, water-soluble carboxyl-containing copolymer selected from the group consisting of (1) copolymers containing about 30 to about 80 mole percent of residues equivalent to olefinically unsaturated monocarboxylic acids and about 70 to about 30 mole percent of residues equivalent to at least one copolymerizable vinylidene comonomer having at least one terminal $>CH_2$ group, and (2) copolymers containing about 50 mole percent of residues equivalent to olefinically unsaturated dicarboxylic acids and about 50 mole percent of residues equivalent to at least one copolymerizable vinylidene comonomer having at least one terminal $<CH_2$ group, said coating being at least about 0.1 micron in thickness.

4,613,484

LOOP REACTOR SETTLING LEG SYSTEM FOR SEPARATION OF SOLID POLYMERS AND LIQUID DILUENT

C. A. Ayres, Bartlesville, Okla.; John N. Scott, Jr., McLean, Va., and Fred T. Sherk, Tokyo, Japan, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 30, 1984, Ser. No. 677,000
Int. Cl.[4] C08F *6/12, 10/06*
U.S. Cl. 422—132 **8 Claims**

1. An apparatus comprising:

a loop reactor defining a fluid flowpath and comprising a series of interconnected alternating vertical and horizontal segments defining a flowpath adapted for a particulate solids-diluent slurry, and

a solids-concentrating device for concentrating said particulate solids from said particulate solids-diluent slurry, comprising in operable sequence,

a first elongated tube disposed at an angle α of about up to 45° from the vertical relative to said horizontal segments of said loop reactor comprising a first end having an opening defined therein and defining a passage therethrough,

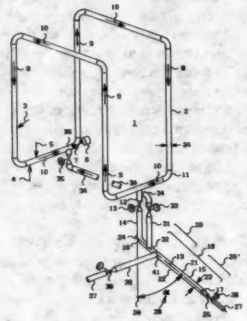
a second end having an opening defined therein,

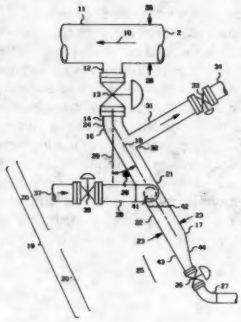
said ends disposed at opposite ends of said first elongated

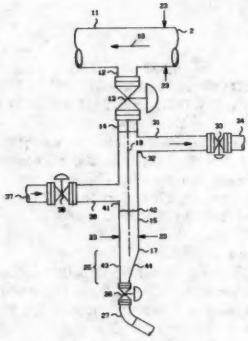
tube, said first elongated tube having a length:diameter ratio greater than 1,

at least one inlet in said tube adapted for diluent feed thereinto,

at least one outlet in said first elongated tube adapted for diluent removal,







said outlet positioned a first distance from said first end along said first elongated tube,

said inlet positioned a second distance along said first elongated tube, wherein said second distance is greater than said first distance;

said second end further connected by fluid-open passage to a first end of a converging member and defining a passage therethrough, and

a second elongated the adapted for fluid passage from said outlet to said loop and closably controllably connected to said loop.

4,613,485

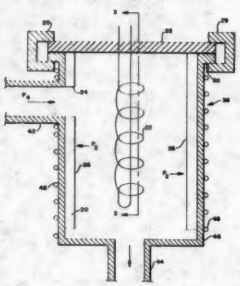
PNICTIDE TRAP FOR VACUUM SYSTEMS

Robert W. Parry, Salt Lake City, Utah; John A. Baumann, Ossining, and Rozalie Schachter, Flushing, both of N.Y., assignors to Stauffer Chemical Company, Westpoint, Conn.

Filed Feb. 17, 1984, Ser. No. 581,101

Int. Cl.[4] F01N *3/10*

U.S. Cl. 422—173 **7 Claims**



1. In a vacuum system including a vacuum chamber coupled in fluid flow relationship to a forepump through a vacuum line, the improvement comprising a trap for pnictide$_4$ vapor species including:

a trap housing disposed in said vacuum line before said forepump,

gas inlet means coupled to said housing for transporting a pnictide$_4$ vapor species thereto,

gas outlet means coupled to said housing,

cracker means disposed in said housing for cracking said pnictide$_4$ vapor species, and

means for cooling at least one wall of said trap housing to a sufficient temperature at which said cracked pnictide species forms a film on said at least one wall.

4,613,486

SEMICONDUCTOR BOULE PULLING ROD

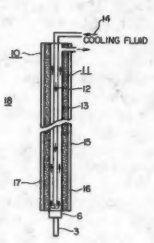
Masayoshi Tatsumi, and Toshihiro Kotani, both of Osaka, Japan, assignors to Sumitomo Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 7, 1984, Ser. No. 618,158

Claims priority, application Japan, Oct. 28, 1983, 58-203161

Int. Cl.[4] C30B *35/00*

U.S. Cl. 422—310 **8 Claims**



1. A single-crystal boule pulling rod for pulling a boule from a melt according to the Czochralski method, comprising:

a main pulling rod having a seed holder at the lower end; and a heating insulating layer integrally attached to and surrounding said main pulling rod and extending the length of said rod with the exception of said seed holder.

4,613,487

FLUE GAS DESULFURIZATION PROCESS

Heeyoung Yoon, McMurray, and Robert M. Statnick, Pittsburgh, both of Pa., assignors to Conoco Inc., Wilmington, Del.

Filed Mar. 22, 1985, Ser. No. 714,748

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

Int. Cl.[4] C01B *17/00*; B01J *8/00*

U.S. Cl. 423—244 5 Claims

1. The method for reducing sulfur dioxide content of a flue gas resulting from combustion in a combustion zone of a sulfur-containing fuel, which method comprises:

(a) injecting into said combustion zone a finely divided dry sorbent comprising calcium carbonate in amount sufficient to provide a metal salt:sulfur ratio of at least about 0.5:1;

(b) spraying into the resulting suspension of sorbent in flue gas at a point where said flue gas has a temperature of between about 120° and about 230° C. an aqueous solution of solubilizing agent, such agent being selected from sodium hydroxide, sodium carbonate, calcium chloride, adipic acid and glycerol;

(c) providing a contact time between said flue gas and droplets resulting from said spraying of at least about 1 second;

(d) subsequently separating from said flue gas solids resulting from drying of said droplets and solids resulting from combustion of said fuel;

(e) discharging from said separating a flue gas of substantially diminished sulfur dioxide content; and

(f) regulating the rate of said spraying relative to the rate of said flue gas such that the temperature of said flue gas at the point of said separating is between about 10° C. and about 35° C. above its saturation temperature.

4,613,488

PROCESS FOR THE PREPARATION OF CRYSTALLINE ALUMINUM SILICATE COMPOUNDS USING PYRIDINE AND A QUATERNARY AMMONIUM COMPOUND

Willibrord A. Van Erp; Josepha M. E. Seelen-Kruijssen, and Tom Huizinga, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 6, 1985, Ser. No. 741,789

Claims priority, application United Kingdom, Sep. 18, 1984, 8423615

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 14 Claims

1. A process for the preparation of a mixture of two crystalline aluminum silicates which comprises crystallizing an aqueous forming solution comprising one or more silicon compounds, one or more aluminum compounds, one or more compounds of metals of Group 1A of the Periodic Table (MX) a quaternary ammonium compound and a nitrogen compound from the group consisting of pyridine, a C_1–C_4 alkyl pyridine or a substituted C_1–C_4 alkyl pyridine compound and at elevated temperatures, subsequently separating said crystallized silicate from said aqueous solution and drying said removed mixture of two crystalline aluminum silicates as represented by the X-ray diffraction patterns of Tables I or II.

4,613,489

PROCESS FOR THE DISPROPORTIONATION OF CHLOROSILANES

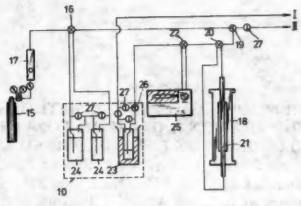
Shiro Morimoto, Tokushima, Japan, assignor to Osaka Titanium Co., Ltd., Hyogo, Japan

Continuation-in-part of Ser. No. 596,317, Apr. 3, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 776,215

Claims priority, application Japan, Aug. 10, 1983, 58-147066

Int. Cl.[4] C01B *33/107*

U.S. Cl. 423—342 3 Claims



1. A process of disporportionation of chlorosilanes in the presence of an anion exchange resin of the macroporous type as a catalyst to produce the disporportionated product of high purity for semiconductor grade silicon, without any contamination from the catalyst comprising the steps of:

providing a water-containing anion exchange cross-linked copolymer resin matrix of the macroporous type by the polymerization of 4-vinylpyridine and divinylbenzene as the catalyst in granular form;

drying the catalyst under vacuum by heating to temperatures up to 200° C.; and

passing trichlorosilane over the dried catalyst at elevated temperatures of about 100° C. up to 200° C. to give a yield of dichlorosilane of greater than 10 mole percent.

4,613,490

PROCESS FOR PREPARING SILICON NITRIDE, SILICON CARBIDE OR FINE POWDERY MIXTURE THEREOF

Takashi Suzuki; Takamasa Kawakami; Rieko Nakano; Takeshi Koyama; Kansei Izaki; Akira Mori, all of Niigata, and Masami Orisaku, Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed May 2, 1985, Ser. No. 729,751

Claims priority, application Japan, May 8, 1984, 59-91354; Aug. 3, 1984, 59-163594; Aug. 7, 1984, 59-165387; Sep. 3, 1984, 59-184214; Nov. 26, 1984, 59-249219; Nov. 27, 1984, 59-250124; Dec. 4, 1984, 59-256398

Int. Cl.[4] C01B *33/06*

U.S. Cl. 423—344 18 Claims

1. A process for preparing fine silicon nitride powders, which comprise carrying out a vapor phase reaction of a silicon compound comprising an aminosilane compound represented by the following general formula:

$$RnSi(NR'R'')_m$$

where R, R′ and R″ represent hydrogen atoms, alkyl groups, allyl groups, and phenyl groups, excluding R, R′ and R″ being hydrogen atoms at the same time, n=0 to 3, and m=4−n, or a cyanosilane compound represented by the following general formula:

$$RnSi(CN)_m$$

where R represents a hydrogen atom, an alkyl group, an allyl group, and a phenyl group, n=0 to 3 and m=4−n, or a silazane compound represented by the general formula:

$[R\ R'\ R''\ Si]_2NR'''$, or

$-[RR'Si—NR''-]_n$

where R, R', R'', and R''' represent hydrogen atoms, alkyl groups, allyl groups, methylamino groups, and phenyl groups, excluding R, R', R'' and R''' being hydrogen atoms at the same time, and n is 3 or 4, in the presence of ammonia, and heat treating the resulting fine silicon nitride powders in an inert gas or non-oxidizing gas atmosphere.

4,613,491

REDISTRIBUTION CATALYST AND METHODS FOR ITS PREPARATION AND USE TO CONVERT CHLOROSILICON HYDRIDES TO SILANE

Il N. Jung; Ko D. Cho, both of Seoul, Rep. of Korea; John C. Lim, Claremont, Calif., and Bok-Ryul Yoo, Kyungki, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed May 14, 1985, Ser. No. 733,883

Int. Cl.[4] C01B *33/04*

U.S. Cl. 423—347 **19 Claims**

1. A process of disproportionation of a chlorosilane selected from the class consisting of trichlorosilane, dichlorosilane, monochlorosilane, and mixtures thereof to silane which comprises contacting the chlorosilane at a temperature between about 0° and 200° C. in the presence of a catalyst which comprises the solid reaction product of from 5 to 75 weight percent of:

(a) an active catalytic ingredient having the formula:

$$(RO)_3Si(CH_2)_nN^+R^3X^-$$
$$\begin{matrix} & R^1 & \\ & R^2 & \end{matrix}$$

wherein:

n is 1 to 4;

R is alkyl having 1 to 4 carbons;

R_1 and R_2 are the same or different alkyl or aryl groups having 1 to 8 carbons;

R_3 is an alkyl- or dialkyl- amino substituted alkyl having 1 to 20 carbons, with the alkyl groups of the amino group being monovalent alkyl or heterocyclic ring having 1 to 10 carbons; and

X is chloride, iodide, or bromide; and

(b) the balance being a silicon containing carrier selected from the class consisting of: (i) a surface hydroxyl bearing solid selected from the class consisting of silica, zeolite, clay, solid silicone resin, and the hydrolyzed solid of silicon compounds having the formula:

$$R^4(CH_2)_nSiX_3$$

wherein:

n is 1 to 4;

X is halide or alkoxy having 1 to 4 carbons; and

R^4 is hydrogen, alkyl, or aryl having a functional group of the class of —SH, —CN,

$$-OC-\underset{\underset{O}{\|}}{C}=\underset{\underset{CH_3}{|}}{CH_2},$$

pyrrolidine, and alkyl amino having 1 to 4 carbons; and

(c) mixtures thereof.

4,613,492

PRODUCTION OF SYNTHESIS GAS

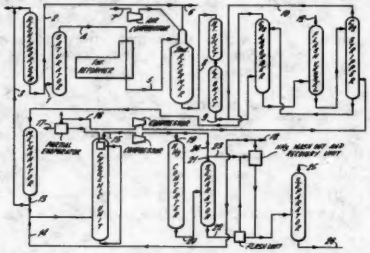
Christopher L. Winter, Great Bookham, England, assignor to Humphreys & Glasgow, Ltd., Great Bookham, United Kingdom

Continuation of Ser. No. 528,640, Sep. 1, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,390

Claims priority, application United Kingdom, Sep. 1, 1982, 8224946

Int. Cl.[4] C01B *2/02, 2/30;* **C01C** *1/04*

U.S. Cl. 423—359 **4 Claims**



1. A process for the production of ammonia wherein excess nitrogen, introduced as air or an oxygen and nitrogen-containing gas, is fed to the secondary reformer, comprising dividing a hydrocarbon-containing feedstock into two parts, steam reforming one part in a tubular steam reformer and then adding to the effluent from the said reformer the other part of the feed, reforming the mixture with air or an oxygen-containing gas in a secondary reformer, cooling the resultant gases, passing these through a carbon monoxide shift section, removing carbon dioxide, methanating and passing the resultant gases into a cryogenic unit which produces:

(a) make-up gas suitable for compressing into an ammonia synthesis section;

(b) a nitrogen-rich stream;

(c) a methane-rich stream (i.e., methane-rich relative to the nitrogen-rich stream);

recycling a part of the nitrogen-rich stream to said cryogenic unit; and compressing the gas from (a) into an ammonia synthesis loop where liquid ammonia is produced.

4,613,493

METHOD OF MANUFACTURE OF CALCINED ALUMINUM FLUORIDE

Arankathu Skaria, Stäfa; Reiner Stark, Ebmatingen, and Hans Schenkel, Forch, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 26, 1981, Ser. No. 315,009

Claims priority, application Switzerland, Nov. 6, 1980, 8233/80; Nov. 6, 1980, 8234/80

Int. Cl.[4] C01B *9/08*

U.S. Cl. 423—489 **11 Claims**

1. A method of manufacturing dust-free aluminum fluoride from aluminum fluoride hydrates comprising:

drying the aluminum fluoride hydrate so as to partially dehydrate said aluminum fluoride hydrate;

separating out the fines of the partially dehydrated aluminum fluoride hydrate from the partially dehydrated aluminum fluoride hydrate;

drying and calcining said partially dehydrated aluminum fluoride hydrate by heating said partially dehydrated aluminum fluoride hydrate to a temperature of between 500° to 600° C. within 45 minutes so as to completely dehydrate and calcine same; and

mixing the fines of the partially dehydrated aluminum fluoride hydrate with a metastable aluminum fluoride solution so as to coarsen said fines.

4,613,494

RECOVERY OF FLUORINE FROM WASTE GASES

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Filed Jan. 8, 1985, Ser. No. 689,787
Int. Cl.[4] C01D *3/02, 11/02, 1/16;* C01B *33/12*
U.S. Cl. 423—490 6 Claims

1. A process for making a fluoride salt solution which is the reaction product of a gaseous mixture of silicon tetrafluoride and hydrogen fluoride and an aqueous alkaline substance selected from the groups consisting of sodium carbonate, sodium bicarbonate, sodium hydroxide, potassium hydroxide, ammonia, and ammonium hydroxide, said process being comprised of the following steps:

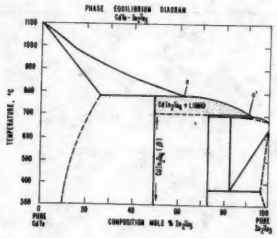
(a) treating in a reactor at a pH of about 8.5 to 9.0 a gaseous mixture containing silicon tetrafluoride and hydrogen fluoride with said aqueous alkaline substance;
(b) precipitating amorphous silica in said reactor in step (a);
(c) separating amorphous silica precipitated in step (b) from solution phase in a clarifier;
(d) discarding amorphous silica separated in step (c);
(e) pumping solution phase from step (c) to an adjusting tank;
(f) adding phosphoric or sulfuric acid to adjusting tank in step (c);
(g) adding additional alkaline substance of step (a) to adjusting tank in step (c);
(h) treating gases from step (a) at a pH of about 5.5 to 6.0 in an absorption tower wherein solution from the adjusting tank is the scrubbing medium;
(i) recycling a portion of the solution from the absorption tower of step (h) to said adjusting tank;
(j) bleeding off another portion of the solution containing fluoride salt from the absorption tower;
(k) treating gases from step (h) in an entrainment separator to separate gases and particulates;
(l) adding collected particulates from step (k) to said adjusting tank;
(m) discharging gases from said entrainment separator to the atmosphere; and
(n) collecting the fluoride salt containing solution from step (j) as product.

4,613,495

GROWTH OF SINGLE CRYSTAL CADMIUM-INDIUM-TELLURIDE

Anthony L. Gentile, Thousand Oaks; Nanse R. Kyle, Topanga, and Fred W. Hill, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 20, 1984, Ser. No. 632,982
Int. Cl.[4] C01B *19/00;* C30B *29/46*
U.S. Cl. 423—508 27 Claims



1. A method for producing a large high-quality single crystal of $CdIn_2Te_4$, said method comprising the steps of:

(a) preparing a mixture of high-purity cadmium, indium and tellurium corresponding to a mixture of from about 62 mole % to about 90 mole % In_2Te_3 and from about 38 mole % to about 10 mole % CdTe, respectively;
(b) sealing said mixture in a clean evacuated ampoule, said ampoule having a dependent cone-shaped tip to initiate growth of a single crystal therein;
(c) melting said mixture by heating said sealed ampoule to a temperature in excess of the melting point of said mixture; and
(d) slowly cooling said melted mixture within said sealed ampoule through said melting point of said mixture to both initiate and maintain to completion the growth of a single crystal of $CdIn_2Te_4$ within said ampoule.

4,613,496

PHARMACEUTICAL CAPSULES OF RIFAMPICIN WITH UNIFORM ELUTION PROPERTIES

Helmut Kopf, Rheinfelden, Switzerland, and Christian Bücher, Freiburg, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,185
Claims priority, application United Kingdom, Mar. 7, 1983, 8306264
Int. Cl.[4] A61K *9/48, 9/52, 9/64*
U.S. Cl. 424—14 4 Claims

1. A solid pharmaceutical composition consisting essentially of a mixture of from about 75% to about 90% of rifampicin, of from about 5% to about 20% of crystalline cellulose, of from about 0.5% to about 5% of sodium lauryl sulfate, and of from about 0.5% to about 5% of magnesium stearate, said solid pharmaceutical composition being in the form of a capsule suitable for oral administration.

4,613,497

DRY, WATER-FOAMABLE PHARMACEUTICAL COMPOSITIONS

Leonard Chavkin, Westfield, N.J., assignor to Health Products Development, Inc., Somerville, N.J.

Filed Feb. 29, 1984, Ser. No. 584,788
Int. Cl.[4] A61C *9/04*
U.S. Cl. 424—44 15 Claims

1. A substantially anhydrous foamable composition capable of forming a substantially stable foam on contact with water comprising:

(a) 20–75 parts by weight of a water soluble polysaccharide gum,
(b) 10 to 50 parts by weight of an effervescent base comprising an alkali metal carbonate or bicarbonate and a water soluble biocompatible acid or acid salt and
(c) 10% to 100% by weight relative to the weight of gum used, of a soluble biocompatible calcium gelling salt, or potassium gelling salt, to the extent that said proportion of potassium salt is not met by the alkali metal carbonate or bicarbonate of (b) where said alkali metal is potassium wherein;
the gum is selected from the group consisting of sodium or potassium alginate, sodium kappa carrageenan or sodium iota carrageenan,
the acid component of the effervescent base is fruit acid or a biocompatible acid salt and
the gelling salt is selected from the group consisting of calcium gluconate, lactate, citrate, formate, chloride, provided that where the gum is kappa carrageenan then the salt is the corresponding soluble potassium salt.

4,613,498

HEMORRHOID MEDICATION

Frank Crosby, 1745 Texar Dr., Pensacola, Fla. 32503

Filed Oct. 24, 1984, Ser. No. 664,313
Int. Cl.[4] A61K *33/06*
U.S. Cl. 424—154 4 Claims

1. A composition for the topical treatment of hemorrhoids, comprising:

a. a semi-solid carrying agent comprising one (1) ounce of petroleum jelly;

b. three (3) to four (4) grams of powdered alum mixed with said carrying agent;
c. one hundred (100) milligrams quinine sulfate powder mixed with said carrying agent; and
d. six hundred and fifty (650) to eight hundred (800) milligrams powdered acetylsalicylic acid mixed with said carrying agent.

4,613,499

SUBSTITUTED CINNAMAL DIALKYL MALONATES IN SUNSCREENING, SKIN CARE COMPOSITIONS

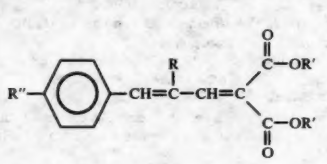
Donald E. Conner, Clifton, N.J., assignor to Van Dyk & Company Inc., Belleville, N.J.

Continuation-in-part of Ser. No. 600,080, Apr. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 404,964, Aug. 3, 1982, Pat. No. 4,457,911. This application Jun. 21, 1985, Ser. No. 747,241

Int. Cl.[4] A61K *7/42, 7/44*

U.S. Cl. 424—59 **10 Claims**

1. A sunscreening, skin care, composition adapted for application to the human skin comprising a nonpolar cosmetic oil carrier containing distributed therein an effective amount to provide substantial protection against erythemal and tanning radiation of between 320 and 400 nanometers of an organic sunscreen selected from the group consisting of 2-ethylhexyl para methoxy cinnamate, homomenthyl salicylate, cinnamal malonate, p-amino-benzoic acid and its esters, and p-dimethyl amino benzoates, and as an adjuvant therefor a substituted cinnamal dialkyl malonate corresponding to the formula,



wherein R is selected from the group consisting of hydrogen and phenyl, R′ is an alkyl radical having from 1 to 2 carbon atoms, and R″ is selected from the group consisting of $(CH_3)_2N$— and CH_3—O—, the total amount of sunscreen and adjuvant being in the range of up to about 10 wt. of the composition.

4,613,500

POWDERY PHARMACEUTICAL COMPOSITION FOR NASAL ADMINISTRATION

Yoshiki Suzuki; Kunio Sekine; Tsuneji Nagai, all of Tokyo; Naoki Nambu, Kanagawa, and Yuji Nishimoto, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 9, 1984, Ser. No. 587,779

Claims priority, application Japan, Mar. 9, 1983, 58-37244

Int. Cl.[4] A61K *9/14, 37/26, 37/30, 39/145*

U.S. Cl. 429—85 **18 Claims**

1. A method for nasal pharmaceutical administration which comprises the step of contacting the nasal mucosa with an intranasally effective amount of a powdery pharmaceutical composition for nasal adminstration consisting essentially of: (A) a physiologically active polypeptide or its derivative selected from the group consisting of a peptide hormone, a physiologically active protein, an enzyme protein and a vaccine, and (B) a water-absorbing and water-insoluble base, wherein at least 90 wt % of the particles of said composition have an effective diameter ranging from 10 to 250 microns.

4,613,501

INACTIVATION OF VIRUSES IN LABILE BLOOD DERIVATIVES

Bernard Horowitz, New Rochelle, N.Y., assignor to New York Blood Center, Inc., New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,513

Int. Cl.[4] A61K *39/18, 39/29*

U.S. Cl. 424—89 **24 Claims**

1. A process for rendering a blood product which comprises a labile protein substantially free of lipid-containing viruses without incurring substantial protein denaturation comprising contacting said product with an effective amount of C_1–C_4-alkyl oleic acid, its ester or alkali or alkaline earth metal salt thereof for a sufficient period of time to inactivate virus contained therein.

4,613,502

PROTEOLYTIC, DRY BIOPOLYMERIC COMPOSITION FOR TREATMENT OF WOUNDS, AND METHOD OF USING SAME

Jaroslava Turková, Cesk Brod, and Jirí Stamberg, Prague, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia

Filed Dec. 6, 1984, Ser. No. 679,118

Claims priority, application Czechoslovakia, Dec. 8, 1983, 9180-83; Dec. 8, 1983, 9181-83

Int. Cl.[4] A61K *37/48, 37/547*

U.S. Cl. 424—94 **5 Claims**

1. A proteolytic, dry, biopolymeric composition for treatment of exudative wounds which comprises small substantially spherical particles of a polysaccharide from the group consisting of crosslinked dextran, chitin and chitosan having bonded thereto an immobilized protease enzyme in an amount sufficient to cause enzymatic decomposition of undesirable proteins in the wound exudate.

4,613,503

ANTIBIOTIC A26201-1 AND ANTIBIOTIC A26201-2 PRODUCED BY A NOVEL STRAIN OF ACTINOPLANES

Joseph W. Whalen; Gregory L. Swartz; Lisa J. Rheaume, and Karen M. McCoy, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 11, 1984, Ser. No. 659,912

Int. Cl.[4] A61K *35/74;* **C12P** *1/06*

U.S. Cl. 424—117 **15 Claims**

1. Antibiotic A26201-1 having the following characteristics:
(1) Ultraviolet absorption spectrum (FIG. 2):

Solvent	Concentration (weight/volume)	λ max (nanometers) Antibiotic A26201-1
100% methyl alcohol	0.1%	205.7, 220.8, 291 (minor), 218 (inflection)
methyl alcohol with 0.1N hydrochloric acid	0.1%	205.3, 220.8, 292 (minor), 218 (inflection)
methyl alcohol with 0.1N sodium hydroxide	0.1%	217.4, 292.7 (minor)

(2) Infrared spectrum (FIG. 4):
The most important absorption bands occur at the following frequencies (cm^{-1}): 1,650, 1,520, 2,680 (sharp peak) 1,000–1,030 (split peak)
(3) Amino acid analysis:
Presence of alanine, cysteine, glutamic acid, glycine, isoleucine, leucine, serine, tryptophan, and valine
(4) Proton NMR analysis (FIG. 6):
Characteristic peaks at (parts per million) 2.8–3.3, 7.2–7.7, 1.0, 1.5, 2.2, 2.4, 3.7 and 4.6
(5) Elemental analysis:

Element	Weight Percentage
Carbon	33.2
Hydrogen	7.0
Nitrogen	6.7
Oxygen	51.7
Sulphur	1.4
Chlorine	Trace

(6) An approximate chemical formula based on the elemental analysis of $C_{55}H_{140}O_{64}N_{10}S$ with an approximate molecular weight of 2000.

4,613,504

PYRIDINE-SOLUBLE EXTRACTS OF MICROORGANISMS

John L. Cantrell, Corvallis, Mont., assignor to Ribi ImmunoChem Research, Inc., Hamilton, Mont.

Continuation-in-part of Ser. No. 535,039, Sep. 23, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,759

Int. Cl.[4] A61K *35/78, 37/00, 31/705*

U.S. Cl. 424—195.1 **10 Claims**

1. A pyridine-soluble extract obtained from a microorganism and containing between about 3 and 20% by weight of protein, about 10 to 40% by weight sugar, and about 35 to 60% by weight fatty acids, said extract having the following approximate elemental analysis in weight percent:

carbon	60.35
hydrogen	9.47
oxygen	23.91

and an infrared spectrum as set forth below:

Peak Frequency (cm^{-1})	Identification
3400 (broad)	NH Stretch
3200–2500 (broad)	Intramolecular hydrogen bonded OH peak
2920 (strong)	CH Stretch
1710 (strong)	Ester carbonyl Stretch
1675 (strong)	Amide carbonyl Stretch (Amide I Band)
1541 (moderate)	Amide II Band

4,613,505

ESTER OF FLURBIPROFEN AND EMULSION CONTAINING THE SAME

Yutaka Mizushima, Kawasaki; Katsuhiro Uchida, Kyoto; Shozoh Masumoto, Shiga; Masao Tohno, Otsu; Yoshinobu Hashimoto, Fujisawa; Kazumasa Yokoyama, Toyonaka; Hiroyuki Okamoto, Akashi; Kiichiro Nabeta, Sennan, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka and Kaken Pharmaceutical Co., Ltd., Tokyo, both of, Japan

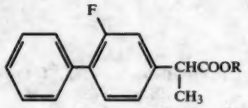
Filed Jun. 19, 1984, Ser. No. 622,244

Claims priority, application Japan, Jun. 20, 1983, 58-110536

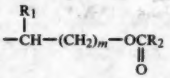
Int. Cl.[4] A61K *31/235, 31/685*

U.S. Cl. 424—80 **16 Claims**

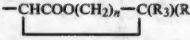
1. An intravenously injectable pharmaceutical emulsion comprising a physiologically acceptable phospholipid emulsifier and particles of soybean oil which contain an effective amount of at least one ester of flurbiprofen of the formula



wherein R is a group of the formula



wherein R_1 is a hydrogen atom or a C_1–C_3 alkyl group, R_2 is a C_1–C_{15} alkyl group or a C_2–C_8 alkenyl group, and m is zero or an integer of 1; or a lactone group of the formula



wherein R_3 and R_4 are same as or different from each other and are a hydrogen atom or a C_1–C_3 alkyl group, and n is an integer of 1 or 2; and an aqueous medium.

4,613,506

METHOD FOR MAKING AN ACIDIC FERMENTING DOUGH FOR THE PREPARATION OF BREAD AND BAKERY PRODUCTS, USING WASTE BREAD

Wilhelm Menge, Hauptstrasse 54, 3001 Isernhagen FB, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,252

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 3233001

Int. Cl.[4] A21D *2/08, 8/02*

U.S. Cl. 426—18 **7 Claims**

1. A method of making an acidic dough for the preparation of bread and bakery products, comprising the steps of (1) mixing an aqueous mixture comprised of flour and waste bread with a culture of lactic and acetic acid bacteria and (2) stirring the resulting mixture at a temperature in the range of about 20° to 30° C. for a period of 15 to 40 hours, such that an acidic dough is produced by fermentation of said waste bread by said bacteria.

4,613,507

MALT-LIKE FLAVOR FROM CEREAL GRAIN ROOT CULTURES

Charles V. Fulger, Millwood, N.Y.; Gerhard J. Haas, Woodcliff Lake, N.J.; Edwin B. Herman, Mohegan Lake, and Charles R. Lazarus, Ossining, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,630

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.[4] A23L *1/10*

U.S. Cl. 426—28 **9 Claims**

1. A process for the preparation of a composition possessing a malt-like flavor from a cereal grain which comprises:

(a) germinating a cereal grain seed selected from the group consisting of wheat, barley, oats, rye, corn, rice or sorghum until sprouted roots develop therefrom;

(b) explanting said sprouted roots from the cereal grain seed and placing them onto a nutrient medium;

(c) culturing the roots until they have matured sufficiently for harvesting;

(d) harvesting the cultured roots prior to production of necrotic material; and

(e) heating the harvested cultured roots until a malt-like flavor is developed.

4,613,508

PROCESS FOR PRODUCING FILLED HARD DOUGH BISCUITS

Toshihiko Shishido, Chigasaki, Japan, assignor to Morinaga & Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1983, Ser. No. 548,759
Claims priority, application Japan, Nov. 9, 1982, 57-196582
Int. Cl.[4] A21D *13/08*
U.S. Cl. 426—281 **2 Claims**

1. A process for producing hard dough biscuits, which comprises:

(a) preparing a cereal dough comprising 10–30 parts by weight of sugar, 10–25 parts by weight of edible fat or oil, 1.5–4.0% leavening agent, 20–35 parts by weight of water, and minor amounts of other materials, per 100 parts by weight of cereal flour;

(b) sheeting said dough by rolling, thereby providing sheets free of pin holes;

(c) forming said sheets into desired shapes;

(d) baking said shaped pieces into hard dough biscuits, whereby the percentage leavening, as expressed by the following equation:

$$\text{percentage leavening} = \frac{\text{volume after baking}}{\text{volume before baking}} \times 100$$

reaches at least 280; and

(e) injecting a non-dough filling as a core material in the thus obtained biscuit by means of a hollow needle.

4,613,509

PROCESS FOR PRODUCING CENTER-FILLED FOOD PRODUCTS

Wendell Ward, Carrollton; Surinder Kumar, Plano; Melba Mack, Dallas; Lewis Keller, Watauga, and Margaret Fitzwater, Lewisville, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 7, 1984, Ser. No. 618,225
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—283 **21 Claims**

1. A process for continuously producing a center-filled food product comprising the following steps in sequence:

(a) continuously forming a hollow cylindrical shell of edible material, and simultaneously continuously forming a single continuous open longitudinal slit in the shell;

(b) drying said shell until it is rigid and self-supporting for receipt of a filling;

(c) continuously filling after drying said shell during movement thereof through said open longitudinal slit with an edible food substance which is substantially stable at product storage temperatures;

(d) then cutting the filled shell into pieces.

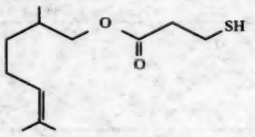
4,613,510

FLAVORING WITH MERCAPTO-C_2-C_3-ALKANOIC ESTERS

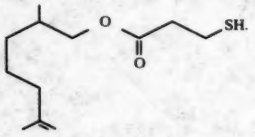
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,344, Mar. 25, 1985, Pat. No. 4,557,941. This application Oct. 4, 1985, Ser. No. 784,308
Int. Cl.[4] A23L *1/226, 1/235*
U.S. Cl. 426—535 **2 Claims**

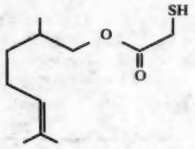
1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of intimately admixing with said foodstuff at the rate of from about 0.001 ppm up to about 250 ppm of an approximately 85:15 ratio of a mixture of



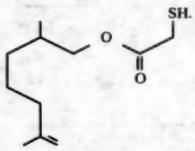
and



2. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of intimately admixing with said foodstuff at the rate of from about 0.001 ppm up to about 250 ppm of an approximately 85:15 ratio of a mixture of



and



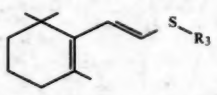
4,613,511

FLAVORING WITH DIALKYLTHIOALKENES, DIALKYLTHIOALKYLCYCLOALKENES AND MONOALKYLTHIOALKENYLCYCLOALKENES

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Kevin P. Miller, Middletown; Domenick Luccarelli, Jr., Neptune, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 731,919, May 8, 1985, Pat. No. 4,565,707. This application Nov. 21, 1985, Ser. No. 800,442
Int. Cl.[4] A23L *1/226, 1/235*
U.S. Cl. 426—535 **4 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of intimately admixing with said foodstuff from about 0.001 ppm up to about 250 ppm of a compound defined according to the structure:



wherein R_3 represents C_1–C_3 alkyl.

4,613,512

EDIBLE MATERIAL CONTAINING M-AMINOBENZOIC ACID OR SALT

Ronald E. Barnett, Suffern, and Ronald G. Yarger, Pearl River, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 430,540, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 274,035, Jun. 15, 1981, abandoned. This application Nov. 21, 1984, Ser. No. 673,812

Int. Cl.[4] A23L *1/236*

U.S. Cl. 426—548 **16 Claims**

1. An edible composition comprising

an edible material,

a food-acceptable sweetener for sweetening said edible material, other than m-aminobenzoic acid or a food-acceptable, non-toxic salt thereof, said sweetener being present in an amount sufficient to sweeten said edible composition and above 1 wt.% sucrose equivalents, and

a sweetness-modifying agent selected from m-aminobenzoic acid, food-acceptable, non-toxic salts thereof, and mixtures thereof wherein the sweetness modifying agent is present in an amount from 0.01 to 0.4% by weight based on the consumed weight of said edible material, said edible composition having a pH of from 2 to 5.5.

4,613,513

ESSENTIAL OILS TREATMENT TO REMOVE HARSH NOTES THEREFROM

Mamoun M. Hussein, Rye, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 713,957, Mar. 20, 1985, abandoned. This application Apr. 26, 1985, Ser. No. 727,509

Int. Cl.[4] C11B *9/00*

U.S. Cl. 426—651 **5 Claims**

1. A process for the removal of harsh flavor off-notes from the distilled essential oil of a botanical material selected from mentha which comprises contacting said oil with Fehlings solution in such amounts as to effect such removal and separating the Fehlings solution from the essential oil.

4,613,514

CACAO BUTTER SUBSTITUTES AND CHOCOLATES CONTAINING THE SAME

Shoji Maruzeni; Toshimichi Yanagihara, and Nozomi Yasuda, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,336

Claims priority, application Japan, Jun. 29, 1983, 58-117701; Apr. 13, 1984, 59-74254

Int. Cl.[4] A23D *5/00;* **A23G** *1/00*

U.S. Cl. 426—607 **8 Claims**

1. A cacao butter substitute comprising a medium melting point fraction of palm oil, characterized by having a solid fat content of 80% or more at 20° C., 20% or more at 30° C., 0% at 33° C. and 0% at 35° C., and showing an initial cooling curve which is identical down to 19° C. to the initial cooling curve of a liquid oil in which no crystals separate when the liquid oil is cooled under conditions of cooling curve measurement.

4,613,515

FINGERPRINT DEVELOPMENT KIT AND PROCESS

Carl J. Reggio, New York, N.Y., assignor to Apple Adhesives, Inc., Hollis, N.Y.

Continuation-in-part of Ser. No. 584,653, Feb. 29, 1984, abandoned. This application Apr. 13, 1984, Ser. No. 599,886

Int. Cl.[4] A61B *5/10;* **B41K** *1/00*

U.S. Cl. 427—1 **14 Claims**

1. Kit means for the development of latent fingerprints from a solid surface, in kit form, the kit comprising a container containing, in liquid form, a polymerizable cyanoacrylate monomer, or polymer precursor, and a polymerization inhibitor admixed with the polymerizable cyanoacrylate monomer or polymer precursor, and in a separate container an inert pad having sorbed therewith at least one catalyst for the polymerization of such cyanoacrylate monomer, or polymer precursor, and a fingerprint development enhancer, sorbed with the inert pad, the enhancer having a vapor pressure in the temperature range of from about 80° to 140° C. and having suitable chemical and physical compatibility so as to be carried together with any cyanoacrylate microcrystalline vapor generated by the pad when contacted with the polymerizable cyanoacrylate monomer or polymer precursor.

9. In a process for developing latent fingerprints on a solid surface, the process comprising contacting on a sorbent solid surface, a polymerizable cyanoacrylate monomer or polymer precursor, previously admixed with a polymerization inhibitor, and a polymerization catalyst, the polymerization catalyst being sorbed with the sorbent solid surface prior to the contacting with the monomer, or polymer precursor; in an amount and in a concentration sufficient to maintain an exothermic polymerization reaction so as to increase the temperature of the reagents and of the solid surface to at least about 80° C. for a period of at least about 3 minutes so as to generate a cyanoacrylate microcrystalline vapor; permitting said vapor to be conveyed to a surface containing a latent fingerprint; and permitting the development of the latent fingerprint by the cyanoacrylate microcrystalline vapor; the improvement which comprises the presence with the sorbent solid surface, or polymer precursor, of a fingerprint development enhancer selected from the group consisting of fluorescent amino acid labeling compounds, silization agents, hydrazide compounds, and amino acid indicator compounds, each of the enhancing compounds having a sufficient vapor pressure at a temperature in the range of between about 80° and 140° C., in the presence of cyanoacrylate microcrystalline vapor, to be carried together with the microcrystalline vapor to the location of the latent fingerprints.

4,613,516

BONDING OF BIOACTIVE GLASS COATINGS

Chhattar S. Kucheria, Mystic, and Rodney E. Wells, Groton, both of Conn., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Feb. 8, 1985, Ser. No. 699,972

Int. Cl.[4] A01N *1/02;* **B05D** *3/02*

U.S. Cl. 427—2 **9 Claims**

1. A method of bonding a bioactive glass coating to a metal substrate comprising applying to said metal substrate a slurry containing a mixture of said bioactive glass and at least one metal oxide selected from the group consisting of cobaltic oxide, and cobaltous oxide, and firing the coated substrate at a temperature of at least about 730° C., said bioactive glass having substantially the same coefficient of expansion as said metal substrate.

4,613,517

HEPARINIZATION OF PLASMA TREATED SURFACES

Joel L. Williams, Cary; Terry S. Dunn, Raleigh; James P. O'Connell, Chapel Hill, and David Montgomery, Cary, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 641,421, Aug. 17, 1984, abandoned, which is a continuation of Ser. No. 488,911, Apr. 7, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,809

Int. Cl.[4] A01N *1/02*

U.S. Cl. 427—2 **29 Claims**

1. In the method of reducing thrombogenicity by attaching heparin to the surface of a polymeric substrate, the improvement comprising subjecting said substrate to a plasma treatment and steeping the plasma-treated substrate with an aqueous dispersion of a cationic surface active agent before attaching said heparin thereto.

4,613,518

MONOLITHIC CAPACITOR EDGE TERMINATION

Mooyoung Ham, Glens Falls, and John W. Duffy, Saratoga Springs, both of N.Y., assignors to SFE Technologies, San Fernando, Calif.

Continuation of Ser. No. 600,618, Apr. 16, 1984, abandoned.
This application Jan. 14, 1985, Ser. No. 691,025
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—38 7 Claims

1. The method of edge termination for a monolithic capacitor in which the electrode layers are bonded in spaced relation by dielectric resin comprising the steps of ashing the substantially planar capacitor edge in an oxygen plasma to remove dielectric between the electrode layers and expose narrow electrode surfaces, vapor depositing a film of metal onto said edges so as to coat and electrically connect said narrow electrical surfaces, and overlaying a layer of conductive material onto said metal coating.

4,613,519

ELECTRON-BEAM-INDUCED INFORMATION STORAGE IN HYDROGENATED AMORPHOUS SILICON DEVICE

Ben G. Yacobi, Denver, Colo., assignor to The United State of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 18, 1985, Ser. No. 713,352
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—39 23 Claims

1. A method for recording and storing information in a hydrogenated amorphous silicon device, comprising:

(a) depositing hydrogenated amorphous silicon on a suitable substrate to form a charge collection device; and

(b) generating defects in said hydrogenated amorphous silicon device, said defects acting as recombination centers that reduce the lifetime of carriers, thereby reducing charge collection efficiency and thus in the charge collection mode of scanning probe instruments, regions of said hydrogenated amorphous silicon device that contain said defects appear darker in comparison to regions of the device that do not contain said defects, leading to a contrast formation for pattern recognition and information storage.

4,613,520

COATING COMPOSITIONS

Sunil P. Dasgupta, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 513,877, Jul. 14, 1983, Pat. No. 4,505,990.
This application Jan. 25, 1985, Ser. No. 695,789
Int. Cl.[4] B05D 5/12; C01G 49/08
U.S. Cl. 427—128 9 Claims

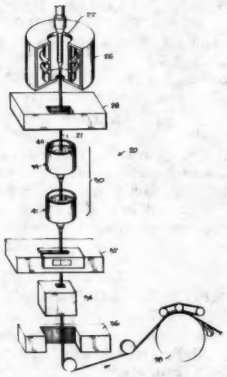
1. An antistatic coating composition comprising a film-forming synthetic resin component, a solvent or solvent system for the resin component, acicular particles of magnetic iron oxide and as the sole antistatic agent, from about 0.2 to about 10% based on coating solids of an alkali or alkaline earth metal, ammonium or amine salt of a perfluoroalkyl sulfonic acid or carboxylic acid having the formula $CF_3(CF_2)_nSO_3H$ or $CF_3(CF_2)_nCOOH$ where n is 0 to 5.

4,613,521

METHODS OF AND APPARATUS FOR COATING A LIGHTGUIDE FIBER

James V. Smith, Jr., Decatur, Ga., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 30, 1983, Ser. No. 509,683
Int. Cl.[4] B05D 5/06
U.S. Cl. 427—169 5 Claims



1. A method of uniformly coating a lightguide fiber, said method including the steps of:

providing a lightguide fiber having a relatively high temperature;

moving the fiber along a path of travel through a first reservoir of a liquid plastic coating material which in the first reservoir is maintained at a temperature that does not exceed about 43° C. to cool the fiber and which is in continuous contact with the fiber; and

moving the fiber out of the first reservoir and through ambient air and then through a second reservoir of the liquid plastic coating material to cause a coating having a uniform thickness to be applied to the fiber.

4,613,522

OXIDATION RESISTANT CARBON-CARBON COMPOSITES

Thomas Vasilos, Winthrop, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed Sep. 29, 1982, Ser. No. 426,600
Int. Cl.[4] B05D 1/36
U.S. Cl. 427—202 11 Claims

1. Method for making an oxidation resistant carbon fiber array-reinforced-carbon matrix composite comprising:

impregnating each one of a number of the carbon fiber array with a resin matrix capable of being converted to a carbon matrix to constitute a preform,

distributing a first material comprising boron or material containing boron in particulate form throughout the resin matrix,

heating said preform to 650° C. to carbonize said resin matrix, and

heating said preform to between 2000° C. and 2300° C. to graphitize said resin matrix, vaporize said first material and disperse said first material throughout said composite,

applying a second material including silicon to said array,

whereby heating said composite to a temperature at which said composite cracks enables said boron and silicon to combine to provide a borosilicate sealant of sufficiently low viscosity for sealing cracks in said composite.

4,613,523
COAL COATING METHOD

Charles E. Smith, Louisville, Ky., assignor to Koal-Kote, Inc., Louisville, Ky.

Filed Jan. 18, 1983, Ser. No. 458,830
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—220 **12 Claims**

1. A process for coating coal particles including

(a) mixing at least two molar equivalents of a fatty acid and one molar equivalent of alkali reactive with said fatty acid to saponify a portion of said fatty acid to form a first mixture;

(b) diluting said first mixture with water to form a second solution;

(c) applying said second solution to the surface of said coal particles.

4,613,524
OPEN-CELL COMPOSITION AND METHOD OF MAKING SAME

Wilhelm E. Walles, Freeland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1986, Ser. No. 822,719
Int. Cl.[4] A21D *6/00*
U.S. Cl. 427—243 **17 Claims**

1. A process for producing a thermally insulated open-cell compound comprising the steps of:

thoroughly dispersing 1–70 parts by weight of at least one monomer having at least one aliphatic carbon-carbon double bond in 99–30 parts by weight of a highly porous microfibrous inert inorganic compound said inorganic compound being formed from particle having a particle size in the range of 60–200 angstrom units and the particles are joined to form fibers; and

polymerizing the monomer with the inorganic compound to a solid mass to coat the inorganic compound while preserving the open-cell porous nature thereof.

4,613,525
INK-JET RECORDING MEDIUM

Shigehiko Miyamoto, Kamagaya, and Takeshi Yamasaki, Funabashi, both of Japan, assignors to Mitsubishi Paper Mills Ltd., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,480
Claims priority, application Japan, Dec. 7, 1984, 59-258760
Int. Cl.[4] B41M *5/00*
U.S. Cl. 427—256 **8 Claims**

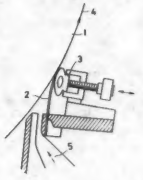
1. An ink jet recording medium for forming a recorded image using a water-base ink containing a water soluble dye wherein the recording medium contains in or on an ink receptive layer a hydrotalcite compound having the chemical composition of magnesium aluminum hydroxy carbonate hydrate and a crystal structure such that the d values of the highest peak, the second highest peak and the third highest peak are 7.89, 3.91, and 2.60, respectively, as determined by the method of X-ray diffraction.

8. An ink jet recording medium according to claim 1 wherein the hydrotalcite compound is present only on the ink receptive layer.

4,613,526
METHOD OF PRODUCING COATED PAPER

Masato Nakamura, and Takashi Kamioka, both of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 609,337, May 11, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 782,723
Claims priority, application Japan, May 25, 1983, 58-9319400
Int. Cl.[4] B05D *3/12;* **B05C** *3/02, 11/02*
U.S. Cl. 427—356 **13 Claims**



1. A method of producing coating paper by applying an aqueous coating composition to a moving base paper web by means of a blade coater, the improvement which comprises:

(a) pressing a flexible blade against a paper web traveling over a backing roll by means of a support member disposed against said blade on the side opposite to said backing roll, to bend said blade and to bring the front section of said blade into pressing contact with said backing roll, and further to bring the back section of said blade into a specific curved surface, the curved surface of said back section of said bent blade being maintained within a zone formularized as follows:

$$Y > 0.03X^2,\ Y < 0.5X^2,\ \text{and}\ 0 < X \leqq 2\ \text{cm}$$

where a point of contact, farthest from the front edge of said blade, between said blade and said backing roll, is the origin, a line tangent to said backing roll at said origin is the X-axis, and a line normal thereto at said origin is the Y-axis; and

(b) maintaining a time interval of 0.0005 to 0.015 second between the time when an aqueous coating composition is applied, in excess, to the base paper and the time when the excess of said coating composition is scraped off the base paper by means of said blade.

4,613,527
PUR-COATING COMPOSITIONS WHICH ARE CROSS-LINKABLE UNDER HEAT, A PROCESS FOR THEIR PRODUCTION AND THEIR USE THEREOF AS AN ADHESIVE COAT FOR TEXTILES

Terry Potter, New Martinsville, W. Va.; Wilhelm Thoma, Leverkusen, and Josef Pedain, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,527
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345071
Int. Cl.[4] B05D *1/36*
U.S. Cl. 427—412 **9 Claims**

1. A coating composition which is cross-linkable by heating which comprises a mixture of

(A) a substantially linear polyurethane polymer which is based on a relatively high molecular weight polyol, a diisocyanate

and a chain lengthening agent, and additionally contains 2,2-bis(hydroxymethyl)-propionic acid amide in a quantity of about 0.5 to 10% by weight, based on the weight of said polyurethane polymer, as the sole chain lengthening agent or a portion thereof, and

(B) melamine- and/or urea-formaldehyde resins.

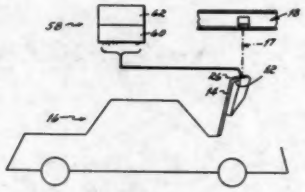
9. In the process for preparing a coated textile substrate by using an adhesive coat to bond a topcoat to a textile substrate, the improvement which comprises using the coating composition of claim 1 as the adhesive coating.

4,613,528

APPARATUS FOR APPLYING A PROTECTIVE COATING TO INNER BODY CAVITIES OF VEHICLES

William P. Moeller, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 19, 1985, Ser. No. 777,626
Int. Cl.[4] B05D 1/02
U.S. Cl. 427—421 **17 Claims**



1. A method of applying a protective coating to the inner cavities of a panel of a vehicle, comprising the steps of:

moving a frame having at least one spray gun into a position locked to the panel of the vehicle;

sending a signal to a controller in response to sensing the presence of said frame in said locked position;

spraying protective coating from said spray guns onto the panel of the vehicle in response to said controller receiving said signal; and

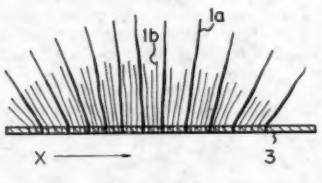
simultaneously rotating said spray guns to obtain a uniform, uninterrupted protective coating on at least a portion of the panel of the vehicle.

4,613,529

INCLINED ARTIFICAL FUR AND METHOD OF MANUFACTURING THE SAME

Yasuo Yamashita; Yoshiteru Kiyomura, and Shunroku Tohyama, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP85/00030, § 371 Date Sep. 25, 1985, § 102(e) Date Sep. 25, 1985
PCT Filed Jan. 25, 1985, Ser. No. 783,231
Claims priority, application Japan, Jan. 25, 1984, 59-10293; Jan. 26, 1984, 59-12596
Int. Cl.[4] B32B 5/06, 7/08
U.S. Cl. 428—15 **18 Claims**



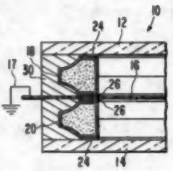
1. An artificial fur of a rising hair structure formed by implanting pile fibers through a base fabric, characterized in that the pile fibers are inclined generally longitudinally, as viewed from above the surface, the pile fibers in the widthwise central section of the rising hair structure extend in parallel to the longitudinal direction, the pile fibers in the opposite peripheral sections extend diagonally widthwise with respect to the longitudinal direction and the pile fibers in the outermost sections of the rising hair structure extend diagonally at angles of 10 to 80 degrees with respect to the longitudinal direction of the rising hair structure.

4,613,530

MULTIPLE PANE GLASS UNIT WITH ELECTRICALLY CONDUCTIVE TRANSPARENT FILM FOR USE AS RADIATION SHIELD

Thomas G. Hood, San Francisco; Steve M. Vincent, San Jose, and Stephen W. Mellentin, Palo Alto, all of Calif., assignors to Southwall Technologies, Inc., Palo Alto, Calif.

Filed Nov. 1, 1984, Ser. No. 667,234
Int. Cl.[4] E06B 3/24
U.S. Cl. 428—34 **9 Claims**



1. A glass unit comprising:

a glass pane having an outer periphery;

a transparent, electrically conductive film adjacent to the glass pane and having a continuous outer peripheral margin in proximity to the outer periphery of the pane, there being a space between the pane and the outer peripheral margin of the film;

a sealant in said space; and

electrically conductive wire cloth means coupled with the film and extending through the sealant for electrically connecting the film to ground, said wire cloth means being continuous and extending about and in electrically coupled relationship with said outer peripheral margin of the film.

4,613,531

LAYERED THERMOPLASTIC ARTICLES AND METHOD FOR FORMING

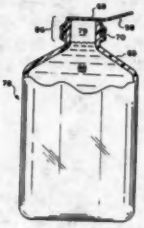
Cem Gokcen, Norwich, England, and Robert J. Williams, Chicago, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 438,813, Nov. 3, 1982, Pat. No. 4,510,115. This application Dec. 18, 1984, Ser. No. 683,310
Int. Cl.[4] B65D 23/00, 51/00
U.S. Cl. 428—35 **1 Claim**

1. A blow molded, hollow thermoplastic container used for storing and dispensing liquids, said container including an outside and a neck defining a dispensing outlet, the improvement comprising:

said dispensing outlet covered by a second thermoplastic material, blow molded simultaneously with said container

and incompatible with the thermoplastic material of said container to define a covered, closed area therebetween



and forming a sealing covering with a tab, whereby said sealing covering is peelable from said container outlet.

4,613,532

DIMENSIONALLY STABLE SHAPED HOLLOW SECTIONS FROM ALIPHATIC POLYAMIDES AND THEIR APPLICATIONS

Klaus Michel, and Armin Gude, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 464,772, Feb. 7, 1983, Pat. No. 4,519,968. This application Jan. 31, 1985, Ser. No. 697,124

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206131; Nov. 25, 1982, 3243612

Int. Cl.[4] F16L *11/06*

U.S. Cl. 428—36 **4 Claims**

1. The product obtained by the method for manufacturing shaped, hollow sections of polyamide plastics dimensionally stable under influence of fuels for internal combustion engines and having a given diameter consisting of:

(a) extruding a hot melt of aliphatic polyamides having at least 5 carbon atoms per carbon amide group or polyamides from an aliphatic dicarboxylic acid and an aliphatic diamine which together have at least 12 carbon atoms through a tube die;

(b) sizing said hot melt through a first gauging device having an inside diameter greater than said given diameter;

(c) cooling said shaped, hollow sections obtained in a cooling bath;

(d) removing the cooled, shaped hollow sections from the cooling bath; and

(e) sizing the cooled, shaped hollow sections adiabatically through a second gauging device having an inside diameter less than said given diameter whereby said given diameter is achieved.

4,613,533

THERMOPLASTIC ELASTOMERIC COMPOSITIONS BASED ON COMPATIBLE BLENDS OF AN ETHYLENE COPOLYMER AND VINYL OR VINYLIDENE HALIDE POLYMER

Gary L. Loomis, Drexel Hill, and Robert J. Statz, Kennett Square, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 572,078, Jan. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 427,413, Sep. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 394,329, Jul. 1, 1982, abandoned. This application May 9, 1985, Ser. No. 732,090

Int. Cl.[4] C08K *5/12*; C08L *45/00, 27/00*; F16L *9/12*

U.S. Cl. 428—36 **21 Claims**

1. A partially crosslinked, thermoplastic, melt-processible, elastomeric blend of

(a) a copilymer of ethylene, at least one ethylenically unsaturated organic monomer X selected from the group consisting of esters of unsaturated C_3–C_{20} mono- or dicarboxylic acids, vinyl esters of saturated C_2–C_{18} carboxylic acids, vinyl alkyl ethers wherein the alkyl group has 1–18 carbon atoms, vinyl or vinylidene halides, acrylonitrile, methacrylonitrile, norbornene, alpha olefins of 3–12 carbon atoms, and vinyl aromatic compounds, and an additional monomer Y selected from the group consisting of ethylenically unsaturated C_3–C_{20} carboxylic acids, carbon monoxide, and sulfur dioxide; and

(b) between 5 and 75 weight percent, based on the composition, of a vinyl or vinylidene halide polymer

wherein the comonomer content in (a) is such that the ehtylene copolymer is compatible with the vinyl or vinylidene halide polymer.

4,613,534

BONDING SURFACES WITH PERMANENT-BOND ADHESIVE

John D. Blizzard, Bay City, Mich., and Bernard VanWert, Norcross, Ga., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 513,504, Jul. 13, 1983, abandoned. This application Jan. 23, 1985, Ser. No. 694,481

Int. Cl.[4] B32B *3/00*; C09J *5/02*

U.S. Cl. 428—57 **31 Claims**

1. A method of providing both an initial bond and a permanent bond with one adhesive between two surfaces, at least one surface being a resin selected from the group consisting of an elastoplastic organopolysiloxane resin and a polytetrafluoroethylene resin, consisting essentially of

(A) applying to the surfaces to be bonded a sufficient amount of a single permanent-bond adhesive to yield a coating of at least 0.1 mm thickness per surface, the adhesive consisting essentially of the product obtained by mixing

(i) 9 to 70 percent by weight of a hydroxyl radical containing solid benzene soluble resin copolymer consisting essentially of $R_3SiO_{\frac{1}{2}}$ units and $SiO_{4/2}$ units where R is a monovalent hydrocarbon radical containing no more than 6 carbon stoms, there being from 0.6 to 0.9 inclusive $R_3SiO_{\frac{1}{2}}$ units for every $SiO_{4/2}$ units,

at least 95 percent of all R radicals in (i) being methyl,

(ii) 30 to 91 percent by weight of a polydiorganosiloxane of the formula

$$HO(R_2SiO)_aH$$

where R is as defined above, a has an average value such that (ii) has a viscosity of greater than 10,000 Pa.s at 25° C.,

(iii) 0.75 to 8 parts by weight based upon 100 parts by weight of (i) plus (ii) of an organohydrogenpolysiloxane compatible with the mixture of (i) and (ii) and having an average unit formula

$$R_bH_cSiO(4-b-c)/2$$

where R is as defined above, b has a value of from 1.00 to less than 2.00, c has a value of from 0.3 to 1.00, the sum of b plus c being from 1.30 to less than 3.00, there being an average of greater than two silicon bonded hydrogen atoms per molecule of (iii), no silicon atom bearing more than one silicon bonded hydrogen atom, the mole ratio of SiH units in (iii) to SiOH units in (i) and (ii) being from

0.2/1 to 1/1, and the weight of hydrogen atoms present on silicon being less than 0.05 g per 100 g of (i) plus (ii),

(iv) 0.5 to 2 parts by weight based upon 100 parts by weight of (i) plus (ii) of a soluble tin catalyst, and

(v) sufficient non-reactive solvent for the mixture of (i), (ii), (iii), and (iv), to yield a flowable adhesive having a combination of viscosity and solids content such that a single application of adhesive can yield an adhesive thickness at least 0.1 mm,

(B) allowing the solvent to evaporate until tacky adhesive surfaces are formed, then

(C) placing the adhesive surfaces together while the adhesive is tacky, obtaining an initial load-bearing bond then

(D) allowing the adhesive to further cure to give a permanent bond.

4,613,535

COMPLEX COMPOSITE ARTICLE HAVING IMPROVED IMPACT RESISTANCE

Gary A. Harpell, Morristown; Igor Palley, Madison, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 28, 1985, Ser. No. 707,010

Int. Cl.[4] B32B *5/12*

U.S. Cl. 428—113 **35 Claims**

1. A composite article of manufacture comprising:

(a) fiber having a tensile modulus of at least about 160 g/denier and a tenacity of at least about 7 g/denier;

(b) a material substantially coating said fiber and consisting essentially of an elastomer which has a tensile modulus (measured at about 23° C.) of less than about 6,000 psi (414 MPa); and

(c) at least one rigid material arranged with said fiber coated with said elastomer to form a rigid composite article.

4,613,536

PACKAGING FOIL

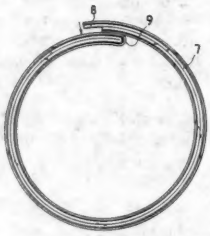
Antero Mälkilaakso, Espoo, Finland, assignor to Printal OY, Helsinki, Finland

Filed Oct. 29, 1984, Ser. No. 666,286

Claims priority, application Finland, Nov., 1983, 834031

Int. Cl.[4] B32B *3/04*; B29D *23/10*; B65D *73/00*

U.S. Cl. 428—124 **5 Claims**



1. A packaging foil for foods and other everyday goods, said foil being defined by at least two barrier layers as well as plastic coatings between the barrier layers and which plastic coatings form the outer surfaces of a sheet of the foil, which foil is formed by joining together and sealing sheets containing one barrier layer, one side of said sheets having been covered with a layer of plastic intended for the protection of the inner and outer surfaces, the outer side having been covered with a layer of plastic intended for sealing as well as the separation and insulation of the barrier layers and by folding the sheet double unsymmetrically to enclose the sealing plastic, in a form that the double layers are of different lengths, the tongue of the longer layer forming a sealing element against the other layer.

5. A method of manufacturing a packaging foil comprising: joining together and sealing two sheets containing one barrier layer, one side of said sheets having been covered with a layer of plastic intended for protection of the inner and outer surface and the other side with a layer of plastic intended for sealing, wherein the foil is formed by folding the foil sheet double and enclosing the sealing plastic, the foil being folded unsymmetrically such that the layers are of different lengths, the tongue of the longer layer thereby forming a sealing element.

4,613,537

GRIP TAPES BASED ON PLASTIC-COATED SUPPORTING MATERIALS

Günther Krüpper, Wartenberg, Fed. Rep. of Germany, assignor to Industrie-Entwicklungen Krüpper, Wartenberg, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,623

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414978

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—192 **27 Claims**

1. Grip tape for humanely handled equipment to provide a non-slip, shock absorbant and moisture accepting surface comprising

a supporting fabric which, before treatment or processing, has, in at least one direction, a stretchability or extendability of from 20% to 50%,

and an impregnant comprising a base of a polyurethane present in at least 70%, by weight of the impregnant, impregnating the supporting fabric, said impregnant being applied by wet coagulation from an anaqueous solution.

4,613,538

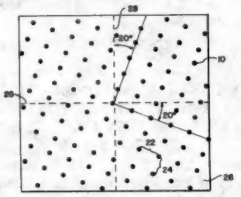
FUSIBLE COATINGS FOR FABRICS

David Wendell, and Thomas M. Mulgrew, Jr., both of Baltimore, Md., assignors to Wendell Textiles, Baltimore, Md.

Filed Sep. 5, 1985, Ser. No. 772,939

Int. Cl.[4] B32B *27/14*

U.S. Cl. 428—198 **5 Claims**



1. A fusible coating for a woven fabric substrate to be bonded to another fabric for simulating a stitch pattern of a jump baste or quilted stitching, comprising:

a plurality of fusible dots bonded to said fabric substrate;

said plurality of dots being arranged in a grid-like pattern having columns and rows, the distance between said rows of fusible dots being 6 to 10 millimeters and the distance between said columns of adhesive dots being 8 to 14 millimeters;

wherein said grid-like pattern is skewed at an angle of 12 to 40 degrees from the direction of weave of said substrate.

4,613,539
METHOD FOR DOPING TIN OXIDE

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 460,572, Jan. 24, 1983, which is a continuation-in-part of Ser. No. 383,452, Jun. 1, 1982, abandoned. This application Aug. 29, 1985, Ser. No. 770,518

Int. Cl.[4] **H01B** *1/06;* **B05D** *1/00*

U.S. Cl. 428—210 **10 Claims**

1. The method of making a resistor element containing a pyrochlore-related compound corresponding to the formula

$$Sn_{2-x}{}^{2+}Ta_{y3}Nb_{y2}Sn_{y1}{}^{4+}O_{7-x-y1/2}$$

wherein

$x=0–0.55$

$y_3=0–2$

$y_2=0–2$

$y_1=0–0.5$ and

$y_1+y_2+y_3=2$,

comprising the sequential steps of

(a) forming a dispersion in organic medium of finely divided particles of SnO, SnO_2, a metal pentoxide selected from the group consisting of Ta_2O_5, Nb_2O_5 and mixtures thereof and inorganic binder having a sintering temperature of below 900° C., the mole ratio of SnO to metal pentoxide being 1.4–3.0, the SnO_2 being in stoichiometric excess of the SnO and metal pentoxide and comprising 20–95% by weight of the total oxides and the inorganic binder comprising 5–45% by weight of the solids content of the dispersion;

(b) forming a patterned thin layer of the dispersion of step (a);

(c) drying the layer of step (b); and

(d) firing the dried layer of step (c) in a nonoxidizing atmosphere to effect volatilization of the organic medium and liquid phase sintering of the inorganic binder.

3. A screen-printable thick film resistor composition comprising a dispersion in organic medium of finely divided particles of SnO, SnO_2, a metal pentoxide selected from the group consisting of Ta_2O_5, Nb_2O_5 and mixtures thereof and inorganic binder having a sintering temperature of below 900° C., the mole ratio of SnO to metal pentoxide being 1.4–3.0, the SnO_2 being in stoichiometric excess of the SnO and metal pentoxide and comprising 20–95% by weight of the total oxides.

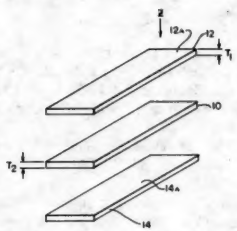
4,613,540
WINDOW FOR BROAD BANDWIDTH ELECTROMAGNETIC SIGNAL TRANSMISSION, AND METHOD OF CONSTRUCTION THEREOF

G. Robert Traut, Danielson, Conn.; Frank S. Keahey, Jr., Atlanta, Ga.; Dennis J. Kozakoff, Marietta, Ga.; Paul M. Bethea, Tanthonia, Ga., and Joseph D. Hensel, Stone Mountain, Ga., assignors to Rogers Corporation, Rogers, Conn.

Filed Oct. 9, 1984, Ser. No. 658,749

Int. Cl.[4] **B32B** *7/02, 5/16;* **B05D** *3/02*

U.S. Cl. 428—212 **23 Claims**



1. An electromagnetic window for transmission in a frequency range having:

a core section of fluoropolymer material having a first dielectric constant;

a second section of fluoropolymer material and a third section of fluoropolymer material;

said core section being sandwiched between said second and third section;

said second and third section each having a dielectric constant approximately equal to the square root of the dielectric constant of said core section; and

said core and second and third sections of fluoropolymer material being a unitary structure with sections of different dielectric constants formed by fusing said sections together under heat and pressure.

4,613,541
ELECTRONIC DEVICE USING ELECTRON TRANSPORT PROTEINS

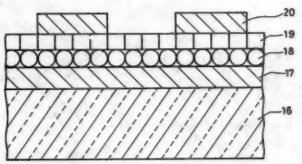
Satoru Isoda, Takarazuka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,068

Claims priority, application Japan, Jan. 12, 1985, 60-3602; Jan. 12, 1985, 60-3603

Int. Cl.[4] **B32B** *9/00, 15/04;* **H01B** *5/00*

U.S. Cl. 428—212 **22 Claims**



1. An electronic device comprising:

a first electron transport protein film prepared by an electron transport protein having a first redox potential;

a second electron transport protein film prepared by an electron transport protein having a second redox potential different from said first redox potential, said second electron transport protein film being joined to said first electron transport protein film;

first electrodes connected to said first electron transport protein film; and

second electrodes connected to said second electron transport protein film, difference between said first and second redox potentials being utilized to provide rectifying characteristics.

4,613,542
METHOD OF IMPREGNATING A WATER-PENETRABLE ARTICLE WITH A SWELL-INHIBITED WATER SWELLABLE CLAY SLURRY

William Alexander, Naperville, Ill., assignor to American Colloid Company, Skokie, Ill.

Continuation-in-part of Ser. No. 720,559, Apr. 5, 1985. This application Aug. 16, 1985, Ser. No. 766,766

Int. Cl.[4] **B32B** *27/04, 9/04, 13/04;* **B05D** *3/02*

U.S. Cl. 428—290 **22 Claims**

1. A method of impregnating a water-penetrable article with a water slurry of a water-swellable clay comprising contacting a surface of the water-penetrable article with the clay slurry wherein the slurry includes water, a water-swellable clay and an anionic polymer having a weight average molecular weight of about 2,000 to about 150,000.

4,613,543

INTERPENETRATING POLYMERIC NETWORK FOAMS COMPRISING CROSSLINKED POLYELECTROLYTES

Shmuel Dabi, Highland Park, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Apr. 27, 1984, Ser. No. 604,710
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—304.4 16 Claims

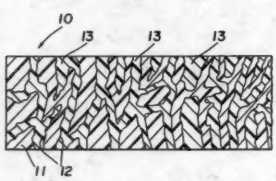
1. An absorbent body for absorbing body fluids comprising a cellular interpenetrating polymer network wherein a first polymer of said network comprises a foamed polymer and a second polymer of said network comprises a crosslinked polyelectrolyte.

4,613,544

WATERPROOF, MOISTURE-VAPOR PERMEABLE SHEET MATERIAL AND METHOD OF MAKING THE SAME

Malcolm B. Burleigh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Dec. 4, 1984, Ser. No. 677,982
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—315.5 15 Claims



1. A waterproof, moisture-vapor permeable unitary sheet material comprising a microporous polymeric matrix having continuous pores comprising continuous passages extending through its thickness and opening into both surfaces thereof, said pores being sufficiently filled with a moisture-vapor permeable, water-impermeable, hydrophilic material to prevent the passage of water through said unitary sheet material.

8. A laminate comprising the sheet material of claim 1 and fabric.

4,613,545

MAGNETIC RECORDING MEDIUM

Ryoji Chubachi, Sendai, and Nobuyuki Nihei, Shiogama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00211, § 371 Date Mar. 1, 1984, § 102(e) Date Mar. 1, 1984, PCT Pub. No. WO84/00241, PCT Pub. Date Jan. 19, 1984
PCT Filed Jul. 1, 1983, Ser. No. 598,325
Claims priority, application Japan, Jul. 1, 1982, 57-114720
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—328 8 Claims

1. A magnetic recording medium having on a nonmagnetic support a magnetic layer measuring from 0.5 to 6 microns and consisting mainly of an acicular ferromagnetic metal powder and a binder, characterized in that said acicular ferromagnetic metal powder has a coercive force of not less than 1,000 Oe, a specific surface area as determined by the BET method, of not less than 45 m^2/g, an axial ratio of not less than 7, and said binder contains not less than 50% by weight of a resin having a molecular weight not in excess of 50,000 and containing at least one polar group selected from the group consisting of polar groups having the general formulas:

$$-SO_3M,\ -OSO_3M,\ -COOM \text{ and } -\underset{\underset{O}{\|}}{\overset{(OM_2)}{\overset{|}{P}}}-(OM_1)$$

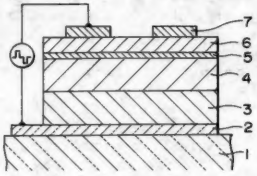
(wherein M is hydrogen, lithium, sodium or potassium; and M_1 and M_2 are hydrogen, lithium, sodium, potassium or alkyl groups), the weight ratio of feromagnetic metal powder to binder being in the range of 5 to 12.

4,613,546

THIN-FILM ELECTROLUMINESCENT ELEMENT

Jun Kuwata, Hirakata; Tomizo Matsuoka, Neyagawa; Yosuke Fujita, Ashiya; Atsushi Abe, Ikoma, and Tsuneharu Nitta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 5, 1984, Ser. No. 678,406
Claims priority, application Japan, Dec. 9, 1983, 58-233015
Int. Cl.[4] H05B *33/22*
U.S. Cl. 428—336 11 Claims



1. A thin-film electroluminescent element comprising a filmy phosphor layer, a filmy dielectric layer having high optical transparency without an optical scattering property and a thickness less than about 0.5 micrometer formed by a sputtering method on at least one side of said phosphor layer, and two electrode layers at least one of which is pervious to light, said electrode layers being so arranged as to apply a voltage to said phosphor and dielectric layers, wherein the essential composition of said dielectric layer is expressed by the following formula:

$$x(Ti_{1-y}A_yO_2)—(1-x)\ (Ba_{1-z}M_zO)$$

wherein x, y and z are the numbers defined as: $0.4 \leqq x \leqq 0.8$, $0.1 \leqq y < 1$, and $0 \leqq z < 0.6$, and A is at least one element selected from the group consisting of Zr, Hf and Sn, and M is at least one element selected from the group consisting of Mg and Ca.

4,613,547

MULTI-LAYER ORIENTED POLYPROPYLENE FILMS

John R. Wagner, Jr., Rochester, and Melvil B. Clauson, Newark, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,782
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—349 9 Claims

1. An oriented film structure comprising a polypropylene film having on at least one surface thereof a layer of a blend of (I) a linear low density copolymer of ethylene with a minor proportion of a C_3–C_{10} alpha olefin and (II) polypropylene wherein said blend layer has a lower coefficient of friction than said polypropylene film.

4,613,548

POLYPHOSPHAZENE MAGNETIC TAPE LUBE

Genevieve S. Lum, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 11, 1985, Ser. No. 700,820
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—411.1 8 Claims

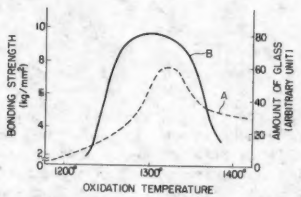
1. A magnetic recording media comprising a substrate having a magnetic recording lamina, said lamina comprising magnetic particles and a binder, said lamina being coated or impregnated with a lubricating amount of a low molecular weight, normally liquid phosphazene oligomer, said oligomer being a mixture of linear and/or cyclic phosphazene oligomers containing about 3–20 —P<=N— units wherein the phosphorus substituents are the same or different and are a mixture of fluoroalkoxy groups having the structure —OCH-$_2$—$(CF_2)_nCF_2X$ wherein n is an integer from 0 to 13 and X is H or F.

4,613,549

BONDED METAL-CERAMICS COMPOSITE

Shun-ichiro Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Feb. 15, 1985, Ser. No. 702,311
Claims priority, application Japan, Feb. 17, 1984, 59-27282
Int. Cl.[4] B32B 15/04
U.S. Cl. 428—469 11 Claims



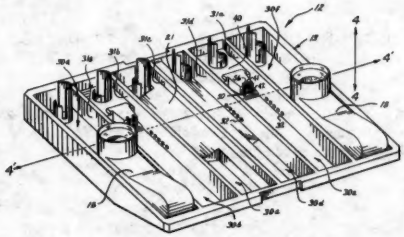
1. A bonded metal-ceramic composite comprising:
(a) a ceramic member consisting essentially of a silicon ceramic;
(b) an oxide layer on a surface of the silicon ceramic member, the oxide layer being in the form of a crystalline phase and an amorphous phase; and
(c) a metal member diffusion bonded to the oxide layer by diffusion of the metal within the oxide layer.

4,613,550

VENTING SYSTEM FOR ELECTRIC STORAGE BATTERIES

Joseph J. Jergl, Minneapolis, and William H. Kump, Mendota Heights, both of Minn., assignors to GNB Incorporated, Mendota Heights, Minn.

Filed Aug. 30, 1985, Ser. No. 770,945
Int. Cl.[4] H01M 2/12
U.S. Cl. 429—53 10 Claims



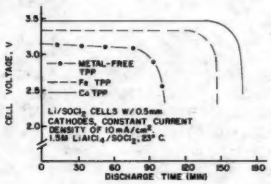
1. A wet, multi-cell, lead-acid electric storage battery comprising a container, a cover assembly, one or more partition walls dividing the space within the container and cover assembly into two or more cells, and a horizontal vent system, which vent systems comprises:
(a) one or more manifolding apertures in one or more of said partition walls, which apertures are of a size which allows passage of gases and minimizes passage of electrolyte and which define one or more sets of manifolded cells;
(b) a single trapping chamber associated with each set of manifolded cells;
(c) one or more vent apertures between each set of manifolded cells and its respective trapping chamber, which vent apertures are of a size which allows passage of gases and minimize passage of electrolyte;
(d) one or more drain/vent apertures between each set of manifolded cells an its respective trapping chamber, which drain apertures are of a size which allows drainage of electrolyte from said trapping chamber to said manifolded cells and minimizes passage of electrolyte from said cells to said trapping chamber; and
(e) a single exhaust port associated with each of said trapping chambers, which exhaust ports allow passage of gas from said trapping chambers to the ambient.

4,613,551

HIGH RATE METAL OXYHALIDE CELLS

Narayan Doddapaneni, Glenside, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 19, 1984, Ser. No. 652,363
Int. Cl.[4] H01M 6/14
U.S. Cl. 429—194 15 Claims


CELL VOLTAGE, V
METAL-FREE TPP
Fe TPP
Co TPP
Li/SOCl$_2$ CELLS W/0.5mm CATHODES, CONSTANT CURRENT DENSITY OF 10 mA/cm², 1.5M LiAlCl$_4$/SOCl$_2$, 25° C.
DISCHARGE TIME (MIN)

1. In a non-aqueous electrochemical cell system having an active metal anode, a cathode and a non-aqueous electrolyte in an oxyhalide depolarizer, the improvement comprising:
a catalyst for the reduction of said oxyhalide depolarizer comprising metal porphyrin complexes selected from the group consisting of monomeric and polymeric tetraphenyl porphyrin (TPP) and tetramethoxyphenyl porphyrin (TMPP) and wherein said metal of said complex is selected from the group consisting of iron and cobalt.

4,613,552

CELL CATHODE MATERIAL

Samuel Ruben, 52 Seacord Rd., New Rochelle, N.Y.

Continuation-in-part of Ser. No. 390,387, Jun. 21, 1982, Pat. No. 4,487,822. This application Nov. 13, 1984, Ser. No. 671,147
Int. Cl.[4] H01M 4/50; B05D 5/12
U.S. Cl. 429—224 24 Claims

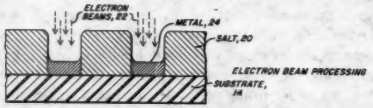
1. A method for forming composite integrally mixed crystals of a permanganate and a powdered conductive material, said method comprising comprising a mixture or suspension of said conductive material in a saturated hot aqueous solution of said permanganate, and agitating said mixture or suspension while evaporating the water, whereupon said composite integrally mixed crystals are produced.

4,613,553

PROCESSING OF METALLIC CHARGE-TRANSFER SALTS

William M. Risen, Jr., Rumford, R.I., and Efstratios I. Kamitsos, Athens, Greece, assignors to Brown University Research Foundation, Providence, R.I.

Filed May 31, 1985, Ser. No. 740,183
Int. Cl.[4] G03C 1/49, 1/50, 1/72; G03H 5/00
U.S. Cl. 430—2 18 Claims



11. A method of forming a holographic image of an object, the method comprising:

(a) applying a film of a metallic charge transfer salt onto a substrate;

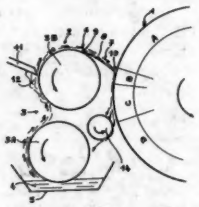
(b) exposing regions of the film to an electron beam in a pattern determined by the image, the beam having sufficient energy and resolution to convert the salt in exposed regions into the free valent species of its constituents and cause the sublimation of the organic charge transfer constituent.

4,613,554

PROCESS FOR DEVELOPING A LATENT IMAGE FORMED ON A MAGNETIC SURFACE, DEVICE FOR CARRYING OUT THE PROCESS AND PRINTING APPARATUS CONTAINING THE SAID DEVICE

Pham K. Quang, Dieppe, France, and Donald H. M. Kings, Rochester, N.Y., assignors to Rhone-Poulenc Systemes, France

Filed May 10, 1984, Ser. No. 609,008
Claims priority, application France, May 11, 1983, 83 08097
Int. Cl.[4] G03G 13/00
U.S. Cl. 430—39 28 Claims



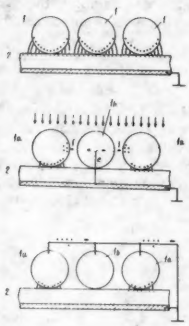
1. A process for developing a latent image formed on a magnetic surface, by means of a magnetic developing powder, in order to form a powder image, which comprises taking the powder from a trough by magnetic means, detaching the powder from the magnetic means and, when detached, freely flowing the detached powder into the vicinity of the magnetic surface so that it flows freely onto the magnetic surface under the influence of the magnetic field produced by the magnetic surface.

4,613,555

IMAGE FORMING METHOD USING ELECTRICALLY CONDUCTIVE, LIGHT TRANSMISSIVE PARTICLES

Hajime Yamamoto, Hirakata; Hiromu Matsuda, Katano; Keiichi Yubakami, Suita, and Yuji Takashima, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00560, § 371 Date Jul. 22, 1985, § 102(e) Date Jul. 22, 1985, PCT Pub. No. WO85/02470, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 22, 1984, Ser. No. 762,149
Claims priority, application Japan, Nov. 30, 1983, 58-225921
Int. Cl.[4] G03G 13/01, 13/22
U.S. Cl. 430—45 7 Claims



7. An image forming method comprising the steps of:

electrostatically adhering onto the surface of a photoconductive substrate a mixture of two or more electroconductive light-transmissive particles containing a sublimable color former which transmits one color selected from the three primary colors of the additive color process and which develops the complementary additive color of said one color by utilizing a color selected from the three primary colors of the subtractive color process;

exposing an image on said particles;

making equipotential the particles through which light is transmitted and the particles through which no light is transmitted;

applying a force to said particles in order to remove the particles having between said particles and said substrate an electrostatic attractive force is under a predetermined value and obtained a particle image consisting of the remaining particles; and

bringing an image receptor having a developer for developing said color former into close contact with said particle image and reacting said color former with said developer, thereby obtaining a developed image of said color former on said image receptor.

4,613,556

HETEROGENEOUS ELECTROPHOTOGRAPHIC IMAGING MEMBERS OF AMORPHOUS SILICON AND SILICON OXIDE

Joseph Mort, Webster; Frank Jansen, Walworth; Koji Okumura, Rochester; Steven J. Grammatica, East Rochester, and Michael A. Morgan, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1984, Ser. No. 662,328
Int. Cl.[4] G03G 5/082, 5/085
U.S. Cl. 430—57 62 Claims

1. An electrographic imaging member consisting essentially of a supporting substrate, a hydrogenated amorphous silicon photogenerating layer, and in contact therewith a charge transporting layer of plasma deposited amorphous silicon

oxide of a thickness exceeding 1 micron and containing at least 50 atomic percent of oxygen.

4,613,557

PHOTORESPONSIVE IMAGING MEMBERS WITH CHEMICALLY MODIFIED PHOTOCONDUCTIVE LAYERS

Geoffrey M. T. Foley, Fairport; James M. Markovics, Rochester; John S. Berkes, Webster; Santokh S. Badesha, Pittsford, and Martin A. Abkowitz, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1985, Ser. No. 713,219
Int. Cl.[4] G03G *5/10*
U.S. Cl. 430—59 **36 Claims**

1. An improved layered photoresponsive imaging member comprised of a supporting substrate, a photogenerating layer, and an electron transporting layer comprised of a chemically modified inorganic photoconductive composition enabling enhancement of the electron transport properties thereof.

4,613,558

HYDROGENATED AMORPHOUS SILICON PHOTOSENSITIVE METHOD FOR ELECTROPHOTOGRAPHY

Katsumi Nakagawa, Tokyo; Toshiyuki Komatsu, Kawasaki; Yutaka Hirai, Tokyo; Teruo Misumi, Toride, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 565,191, Dec. 23, 1983, Pat. No. 4,557,990, which is a division of Ser. No. 269,846, Jun. 3, 1981, Pat. No. 4,461,819, which is a continuation of Ser. No. 16,986, Mar. 2, 1979, abandoned. This application Aug. 7, 1985, Ser. No. 763,214
Claims priority, application Japan, Mar. 3, 1978, 53-24628; Mar. 14, 1978, 53-29030; Apr. 28, 1978, 53-51851
Int. Cl.[4] G03G *5/085*
U.S. Cl. 430—84 **6 Claims**

1. An electrophotographic process comprising:
(a) applying a charging treatment to an image-forming member for electrophotography which comprises a substrate for electrophotography and a charge generation layer being formed of amorphous silicon and containing 1–40 atomic percent of hydrogen, and
(b) irradiating said image-forming member with an electromagnetic wave carrying information, thereby to form an electrostatic image.

4,613,559

PROCESS FOR COLORED TONER COMPOSITIONS WITH CONTROLLED CHARGES THEREON

Christopher K. Ober, Oakville; Kar P. Lok, Mississauga; Michael L. Hair, Oakville, and Randolph E. Branston, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1985, Ser. No. 718,675
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—137 **22 Claims**

1. An improved process for obtaining positively charged or negatively charged colored toner compositions of a particle diameter of from about 5 to about 20 microns by dispersion polymerization which comprises providing a monomer or comonomer solution with stabilizer therein, polymerizing the resulting mixture, adding thereto a dye solution comprised of an organic solvent having dissolved therein oil soluble dyes, causing the dye solution to diffuse into the polymer particles, wherein the stabilizer is chemically and permanently attached to the toner polymer particles.

4,613,560

PHOTOSENSITIVE CERAMIC COATING COMPOSITION

Thomas E. Dueber; David H. Scheiber, both of Wilmington, and Howard E. Simmons, III, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1984, Ser. No. 687,460
Int. Cl.[4] G03C *1/68*
U.S. Cl. 430—286 **6 Claims**

1. A photosensitive ceramic coating composition which is fireable in a substantially nonoxidizing atmosphere comprising an admixture of:
(a) finely divided particles of ceramic solids having a surface area-to-weight ratio of no more than 10 m^2/g and at least 75 wt. % of the particles having a size of 1–10 μm, and
(b) finely divided particles of an inorganic binder having a glass transition temperature of 550°–825° C., a surface area-to-weight ratio of no more than 10 m^2/g and at least 95 wt. % of the particles having a size of 1–10 μm, the weight ratio of (b) to (a) being 0.6–2, dispersed in an organic medium comprising
(c) an organic polymeric binder selected from the group consisting of (1) homopolymer and copolymers of C_{1-10} alkyl acrylates, C_{1-10} alkyl methacrylates, alpha-methylstyrene and 0–2 wt. % ethylenically unsaturated carboxylic acid, amine or silane-containing compounds, (2) homopolymers and copolymers of C_{1-10} mono-olefins, and (3) homopolymers and copolymers of C_{1-4} alkylene oxide and mixtures thereof, the binder comprising 5–25 wt. % basis total inorganic solids, and
(d) a photoinitiation system, dissolved in
(e) photohardenable monomer, the monomer comprising 5–45% wt. of the dry photopolymerizable layer and
(f) an volatile organic solvent.

4,613,561

METHOD OF HIGH CONTRAST POSITIVE O-QUINONE DIAZIDE PHOTORESIST DEVELOPING USING PRETREATMENT SOLUTION

James M. Lewis, 496 Shetland, Williamsville, N.Y. 14221, assignor to James Marvin Lewis, Williamsville, N.Y.

Filed Oct. 17, 1984, Ser. No. 661,751
Int. Cl.[4] G03F *7/26*
U.S. Cl. 430—326 **7 Claims**

1. In a process for developing a positive radiation sensitive resist film comprised of quinone diazide sulfonic acid derivatives and alkali soluble resin that has been coated on a substrate and an image thereon is exposed to radiation and thereafter developing this exposed resist film to form a contrasting surface relief pattern between the exposed image and the unexposed resist film, the improvement which comprises:
(a) contacting the exposed film with an aqueous alkaline pretreatment solution containing from about 0.001 percent to about 1.0 percent based on the weight of the pretreatment solution of the surfactant selected from the group consisting of a fluorocarbon or carboxylated surfactant and sufficient base to provide alkalinity
(b) subjecting the pretreated film obtained from step (a) to an aqueous rinsing; and
(c) contacting the thus pretreated film from step (b) with an aqueous developer solution having a pH of at least 9 and containing at least 0.0001 percent based on the weight of the developer of a surfactant selected from the group consisting of fluorocarbon and carboxylated surfactants to dissolved the exposed image on said film.

4,613,562

PROCESS OF REPLENISHING COLOR DEVELOPING SOLUTION WITH REPLENISHER COMPOSITIONS

Satoru Kuse; Shigeharu Koboshi, and Kazuhiro Kobayashi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,567
Claims priority, application Japan, Apr. 16, 1984, 59-77146
Int. Cl.[4] G03C 5/30, 7/30
U.S. Cl. 430—450 9 Claims

1. A process for replenishing a color developing solution in an automatic processing machine by using a replenisher composition comprising at least two separate solutions one of said solutions being a solution having an alkaline substance dissolved therein and another of said solutions being a solution containing an alkali-cleavable water-soluble salt of a poorly soluble alcohol.

4,613,563

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Ashita Murai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1985, Ser. No. 696,229
Claims priority, application Japan, Jan. 31, 1984, 59-15504
Int. Cl.[4] G03C 5/24
U.S. Cl. 430—523 7 Claims

1. A silver halide photographic light-sensitive material comprising a support having provided thereon at least one internal latent image direct positive silver halide emulsion layer, wherein:

(1) said internal latent image direct positive silver halide emulsion layer comprises at least two layers having substantially the same color sensitivity but differing in speed, or

(2) at least said internal latent image direct positive silver halide emulsion and a solid pigment-containing layer contiguous thereto, which is positioned on the side opposite to the side of the silver halide emulsion layer to be exposed, are provided,

and wherein at least one internal latent image direct positive silver halide emulsion in (1) or (2) has a binder/silver halide (calculated as silver) ratio by weight of more than 1.25.

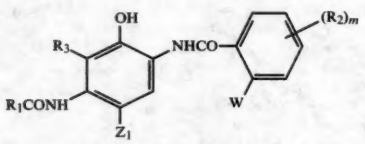
4,613,564

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shun Takada; Takashi Kadowaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

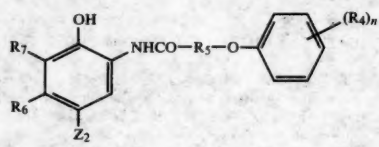
Filed Apr. 18, 1985, Ser. No. 724,476
Claims priority, application Japan, Apr. 19, 1984, 59-78887
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] G03C 7/32, 7/34
U.S. Cl. 430—549 7 Claims

1. A silver halide photographic material having one or more silver halide emulsion layers formed on a support, at least one of said silver halide emulsion layers containing a cyan coupler of formula (I) in combination with a cyan coupler of formula (II):



(I)

(wherein R_1 is a ballast group; R_2 is a halogen atom or a monovalent organic group; m is an integer of 0 to 4, provided that when m is 2 or more, R_2 may be the same or different; R_3 is a hydrogen atom or a halogen atom; W is a halogen atom or an alkyl group; and Z_1 is a hydrogen atom or a group capable of leaving upon reaction with the oxidized product of an aromatic primary amine color developing agent);



(II)

(wherein R_4 is an alkyl or alkoxy group; n is an integer of 0 to 5, provided that when n is 2 or more, R_4 may be the same or different; R_5 is an alkylene group; R_6 is an alkyl group; R_7 is a hydrogen atom, a halogen atom or an alkyl group; and Z_2 is a hydrogen atom or a group capable of leaving upon reaction with the oxidized product of an aromatic primary amine color developing agent).

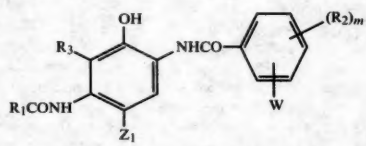
4,613,565

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shun Takada; Takashi Kadowaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

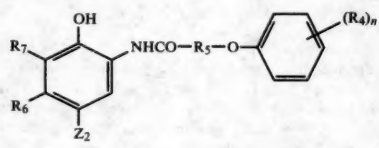
Filed Apr. 18, 1985, Ser. No. 724,576
Claims priority, application Japan, Apr. 19, 1984, 59-78888
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] G03C 7/32, 7/34
U.S. Cl. 430—549 8 Claims

1. A silver halide photographic material having one or more silver halide emulsion layers formed on a support, at least one of said silver halide emulsion layers containing a cyan coupler of formula (I) in combination with a cyan coupler of formula (II):



(I)

(wherein R_1 is a ballast group; R_2 is a halogen atom or a monovalent organic group; R_3 is a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group; W is an alkyl-sulfonamido group, an arylsulfonamido group, an alkylsulfamoyl group or an arylsulfamoyl group; m is an integer of 0 to 4, provided that when m is 2 or more, R_2 may be the same or different; and Z_1 is a hydrogen atom or a group capable of leaving upon reaction with the oxidized product of an aromatic primary amine color developing agent);



(II)

(wherein R_4 is an alkyl or alkoxy group; n is an integer of 0 to 5, provided that when n is 2 or more, R_4 may be the same or different; R_5 is an alkylene group; R_6 is an alkyl group; R_7 is a hydrogen atom, a halogen atom or an alkyl group; and Z_2 is a hydrogen atom or a group capable of leaving upon reaction

with the oxidized product of an aromatic primary amine color developing agent).

4,613,566

HYBRIDIZATION ASSAY AND KIT THEREFOR

Huntington Potter, Somerville, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jan. 23, 1984, Ser. No. 573,013

Int. Cl.[4] C12Q *1/68;* G01N *33/566, 33/567*

U.S. Cl. 435—6 16 Claims

1. The method of assaying by hybridization a plurality of DNA or RNA fragments which comprises

providing a probe sheet in the form of a pattern of parallel bands of labelled probe material comprising DNA or RNA fragments on a porous carrier sheet saturated with buffer free from solvent capable of eluting DNA or RNA fragments from said probe sheet,

providing a first test sheet comprising a pattern of parallel bands of test material comprising DNA or RNA fragments, unlabelled or labelled differently from said probe material, said test material being immobilized on a porous carrier sheet saturated with buffer free from solvent capable of eluting DNA or RNA fragments from said probe sheet,

placing said first test sheet in face to face contact with said probe sheet with said patterns of bands rotated with respect to each other so that said bands cross each other,

providing at least one additional test sheet comprising a pattern of parallel bands of test material comprising DNA or RNA fragments immobilized on a porous carrier sheet saturated with buffer containing solvent capable of eluting DNA or RNA fragments from said probe sheet,

stacking said additional test sheets in face to face contact with said first test sheet at the side opposite said probe sheet with their bands aligned with the bands of said first test sheet to form an assemblage comprising said probe sheet and all said test sheets,

maintaining said assemblage at a temperature from 30° to 100° C. to permit hybridization to occur while maintaining said buffers in static condition,

separating said test sheets from said assemblage and washing to remove unhybridized labelled material therefrom, and

determining on each test sheet the location of hybridized material.

4,613,567

IMMUNOASSAY METHOD FOR MEASURING IMMUNOLOGICAL ANTIGEN IN FLUID SAMPLE

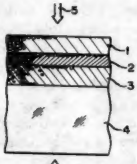
Seikichi Yasoshima; Mikio Koyama, and Kenichiro Okaniwa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1983, Ser. No. 520,072

Claims priority, application Japan, Aug. 19, 1982, 57-144341

Int. Cl.[4] C12Q *1/00;* G01N *21/64, 33/558, 33/543*

U.S. Cl. 435—7 18 Claims



1. An immunoassay method for measuring an immunological antigen in a fluid sample, which comprises:

contacting said fluid sample with a first detecting layer of an immunological analytical element in the presence of a labeled antigen, said element comprising sequentially the first detecting layer, a blocking layer, a second detecting layer and a substrate and at least one of said first and second detecting layers contains an antibody capable of binding specifically to said antigen and labeled antigen to carry out a competitive reaction of said antigen and said labeled antigen with said antibody; and

separately measuring the amount of the unreacted labeled antigen and the amount of binding complex of said labeled antigen and said antibody of both said first and said second detecting layers to determine the amount of said antigen in said fluid sample.

4,613,568

METHOD FOR RELEASE AND SEPARATION OF PARASITES OR PARASITE EGGS FROM MEAT

Gottfried Pfeiffer, Eching, Fed. Rep. of Germany, assignor to A/S N. Foss Electric, Denmark

Filed Apr. 25, 1984, Ser. No. 603,688

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314937

Int. Cl.[4] C12Q *1/38;* A23L *1/31;* C07G *17/00, 15/00*

U.S. Cl. 435—23 10 Claims

1. A method for the release and separation of parasites or parasite eggs from meat comprising:

agitating meat with pepsin at about pH 5.5 until the non-binding membrane containing part of said meat is predominantly dispersed;

adjusting the pH to between 0.8 and 2.2 by the addition of acid;

continuing agitation until the main part of the parasites or parasite eggs are released and only a few particles containing connective tissue or blood vessels are present; and

filtering the mixture through a series of at least two filters, the first filter comprising a sieve having openings 1 to 2 millimeters in diameter and the last filter comprising a sieve having pores with a diameter of 12 to 30 microns, whereby the last filter retains the parasites or parasite eggs for microscopic examination.

4,613,569

STABILIZED COMPOSITION OF TETRAZOLIUM SALTS

Edda Geisler, Mannheim; Helmut Feuerstein, Mannheim-Ilvesheim, and Hans Lange, Lampertheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 328,315, Dec. 7, 1981, abandoned. This application Mar. 27, 1984, Ser. No. 593,192

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048662

Int. Cl.[4] C12Q *1/32, 1/26, 1/28, 1/54*

U.S. Cl. 435—26 13 Claims

1. Method for the detection of reducing materials by means of tetrazolium salts which method comprises adding a tetrazolium salt stabilized by the addition of 1 to 10 moles of a complex-forming acid selected from the group consisting of boric acid and an organic hydroxypolycarboxylic acid which is soluble in polar solvents, per mole of tetrazolium salts, to a solution buffered to the reaction conditions of the other reagents; subsequently adding the sample thereto and measuring the color change.

4,613,570

NOVEL THERMOSTABLE, ACIDURIC ALPHA-AMYLASE AND METHOD FOR ITS PRODUCTION

Nancy W. Zeman, Sleepy Hollow, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Feb. 8, 1985, Ser. No. 699,772
Int. Cl.[4] C12P 19/14; C12N 9/28; C12R 1/145
U.S. Cl. 435—99 6 Claims

1. An alpha-amylase enzyme derived from *Clostridium thermohydrosulfuricum*, said enzyme having a molecular weight of about 72,000±3,000 as determined by SDS-polyacrylamide gel electrophoresis, showing a half-life of about 450 minutes when held at 80° C. and pH 4.5 in the presence of 5 mM Ca^{++}, having a maximum alpha-amylase activity at a pH of about 5.5 when measured at 80° C., and having a maximum alpha-amylase activity at pH 5.0 at about 60° C.

4,613,571

POLYPRENYL SULFONE DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

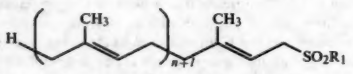
Akio Sato, Yatabemachi; Kenji Nakajima, Sakuramura; Yoshimasa Takahara, Narashino; Shizumasa Kijima, Niiza; Hideaki Watanabe, Kisogawamachi; Tamio Kawamura, Kakamigahara, and Yasushi Nagai, Tokyo, all of Japan, assignors to Esai Co., Ltd. and General Director of the Agency of Industrial Science and Technology, both of Tokyo, Japan

Division of Ser. No. 368,475, Apr. 14, 1982. This application Feb. 21, 1984, Ser. No. 581,763
Claims priority, application Japan, Apr. 17, 1981, 56-58223
Int. Cl.[4] F27B 9/02; F27D 5/00
U.S. Cl. 435—130 1 Claim

1. A process for producing a polyprenyl sulfone derivative of the formula:

(I)

wherein n is an integer of 1 to 4, R_1 is aryl and R_2 is hydroxymethyl or carboxyl, which comprises culturing the BPM1613 strain of the genus Nocardia capable of forming a compound of formula (I) by oxidizing a compound of the formula:



(II)

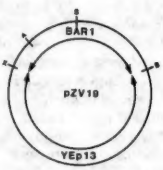
in a culture medium containing the compound of formula (II) until the compound of formula (I) is formed and then recovering the compound of formula (I) from the culture medium.

4,613,572

YEAST BAR1 GENE PLASMID

Vivian L. MacKay, Seattle, Wash., and Thomas R. Manney, Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans. and Rutgers Research and Educational Foundation, Piscataway, N.J., a part interest to each

Filed Aug. 15, 1983, Ser. No. 523,652
Int. Cl.[4] C12N 1/20, 1/18, 15/00, 1/16
U.S. Cl. 435—253 15 Claims



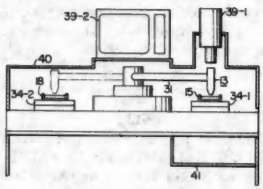
1. A synthetic recombinant DNA molcule, containing a DNA sequence comprising the BAR1 structural yeast gene.

4,613,573

AUTOMATIC BACTERIAL COLONY TRANSFER APPARATUS

Katsujiro Shibayama; Fukuo Iwaya, both of Tokyo; Kensaku Takahashi, Hiratsuka; Masumi Nukumi, Ome; Tatuhito Tuji, Uji; Michio Okuma, Tokyo, and Yoji Odawara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Electronics Engineering Co., Ltd., Kanagawa, both of, Japan

Filed May 17, 1983, Ser. No. 495,489
Claims priority, application Japan, May 20, 1982, 57-84011; Jul. 12, 1982, 57-119739
Int. Cl.[4] C12M 1/36, 1/00, 1/12, 1/26
U.S. Cl. 435—289 11 Claims



1. An automatic bacterial colony transfer apparatus comprising:

a computer with memories;

a culture container in which bacterial colonies are cultivated;

a test container into which a specific one of the bacterial colonies is transferred from said culture container;

two X-Y stages on which said culture container and said test container are respectively mounted, said X-Y stages being arranged to be independently movable of each other under the control of said computer;

a monitor section for monitoring the bacterial colonies on a surface of a medium in said culture container to observe said specific one of the bacterial colonies, said monitor section including a television camera disposed above said culture container and a display device disposed at a position suitable for observation by an operator, said television camera being provided for photographing the bacterial colonies in said culture container, said display device being provided for displaying an enlarged picture image of said colonies and said display device is also provided with a cursor for selecting said specific one of said bacteria colonies in said culture container on said display

device, said memories storing information with respect to the position of said specific bacterial colony, and each of said Y-Y stages is moved in accordance with the movement of said cursor and under the control of said computer;

a pickup section having an end portion for picking up said specific bacterial colony from said culture container and for transferring the picked-up bacterial colony to a surface of a medium in said test container; and

a transporting section for sequentially transporting said pick-up section between said culture and said test container under the control of said computer, whereby said specific bacterial colony is selected through said monitor section and automatically transferred from the medium of said culture container to the medium of said test container.

4,613,574

IN VITRO TEST FOR OCULAR TOXIC PROPERTIES

Hyman C. Bergman, Los Angeles; James F. Godfrey, Venice, and Virginia C. Gordon, Pacific Palisades, all of Calif., assignors to Preventive Diagnostics Corporation, Carson, Calif.

Filed May 4, 1984, Ser. No. 607,483

Int. Cl.[4] G01N *21/75, 33/50*

U.S. Cl. 436—2 **12 Claims**

1. A method for determining the toxicity of a material to the human eye, which method comprises:

(a) contacting said material with a reagent which comprises:

at least one precipitant in a concentration effective in precipitating in the presence of an ocular irritant; and

at least one stabilizer in a concentration effective in preventing precipitation of the precipitant in the absence of an ocular irritant;

in admixture with an aqueous medium to provide a clear aqueous liquid of compatible pH and ionic strength; and

(b) measuring the amount of precipitate formed; and

(c) comparing this amount with the amount of precipitate obtained using comparable amounts of a substance known to cause eye irritation.

4,613,575

INDICATOR FOR DETERMINING ORGANIC ISOCYANATES ON A CARRIER

Bernhard Westrup, and Joachim Marcoll, both of Lubeck, Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,520

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407687

Int. Cl.[4] G01N *31/22*

U.S. Cl. 436—106 **13 Claims**

1. Indicator kit for detecting organic isocyanates in a test medium, comprising a carrier for receiving a test medium, said carrier having supported thereon bis-4-(dimethylamino)-phenyl-methyleneimine-hydrochloride plus a non-volatile basic nitrogen compound as catalyst for its reaction with organic isocyanates to form a compound, as one component of the kit, and an acidic developer, as the other component of the kit, and the acidic developer being applicable to the carrier to react with the formed compound and produce a coloration which is indicative of the presence of organic isocyanates in the test medium.

12. Method of indicating the presence of organic isocyanates in a test medium, comprising passing the test medium to a carrier having supported thereon bis-4-(dimethylamino)-phenyl-methyleneimine-hydrochloride plus a non-volatile basic nitrogen compound as catalyst for reacting it with organic isocyanates to form a compound, and applying an acidic developer to the carrier after it has been exposed to the test medium to produce a color reaction with the formed compound, the color reaction being indicative of the presence of organic isocyanates.

4,613,576

HUMAN MONOCLONAL ANTIBODIES TO CANCER CELLS

Richard J. Cote; Donna M. Morrissey; Alan N. Houghton; Edward J. Beattie, Jr., all of New York, N.Y.; Herbert F. Oettgen, New Canaan, Conn., and Lloyd J. Old, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,830

Int. Cl.[4] C12N *15/00, 5/00;* **G01N** *33/53;* **C12P** *21/00*

U.S. Cl. 436—548 **11 Claims**

4. An immunoassay for human cells comprising contracting said cells with at least one monoclonal antibody selected from the group consisting of HB 8223, HB 8237, HB 8238, HB 8239 under conditions favoring formation of an antigen:antibody complex between said antibody and an antigen or antigens to which said antibodies specifically bind, and observing the formation of said complex or the absence of said formation.

4,613,577

FIBER GLASS MAINLY COMPOSED OF CALCIUM PHOSPHATE

Hideo Tagai, Tokyo; Masahiro Kobayashi, Funabashi; Shigeo Niwa, Aichi; Hiroyasu Takeuchi, Saitama, and Mikiya Ono, Hanno, all of Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,658

Claims priority, application Japan, Jul. 6, 1983, 58-12164

Int. Cl.[4] C03C *13/00*

U.S. Cl. 501—35 **12 Claims**

1. A fiber glass for filling in a defect or hollow portion of bone, said fiber glass having a negative zeta potential and containing calcium phosphate having a molar ratio of Ca to P of not less than 0.2 and less than 0.6, and the total content of CaO plus P_2O_5 in the fiber glass, based on the weight of the fiber glass, being not less than 80% by weight.

4,613,578

POROUS ZEOLITE GRANULES STABLE IN AQUEOUS SOLUTIONS

Elliot P. Hertzenberg, Wilmington, Del., assignor to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 622,363, Jun. 20, 1984, abandoned. This application Apr. 19, 1985, Ser. No. 725,064

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—64 **12 Claims**

1. Porous zeolite-silicate granules stable in aqueous effluents and solutions and suitable for ion exchange consisting of particles of zeolite adhering to particles of alkali metal silicate, 4 to 15 parts by weight of zeolite being present for each part by weight of silicate, said silicate containing 1.4 to 4.5 moles of SiO_2 per mole of M_2O, wherein M is sodium, potassium or a mixture thereof, and having 18 to 22% moisture with bulk densities of 28 to 42 lb/cu ft, said granule being rendered stable in aqueous systems by heating to insolubilize the silicate.

10. The process of preparing porous Zeolite NaA sodium silicate granules which are stable in aqueous effluents and solutions and suitable for ion exchange, comprising the steps of:

(a) tumbling a mixture of 4 to 15 parts by weight of particles of Zeolite NaA for each part by weight of particles of sodium silicate that contains 2.0 to 4.0 moles of SiO_2 for each mole of Na_2O;

(b) adding sufficient water to said tumbling mixture to initiate agglomeration between the zeolite and silicate particles;

(c) heating and tumbling the dampened partially agglomerated mixture in a closed container for a time sufficient to complete formation of granules;

(d) heating the tumbling granules in an open container to remove at least about 80% of the moisture added in step (b);

(e) heating the granules above about 225° C. but below about 515° C., thereby stabilizing said granules in aqueous systems; and

(f) rehydrating the granules to 18 to 22% water by exposure to water vapor or a water spray.

4,613,579

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Hiroyuki Furuhashi; Tadashi Yamamoto; Masafumi Imai, and Hiroshi Ueno, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 761,240

Claims priority, application Japan, Jul. 31, 1984, 59-159118

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—115 **21 Claims**

1. A titanium containing supported catalyst component comprising the product obtained by contacting

(1) a reaction product of

(a) a dihydrocarbyl magnesium compound, mixtures thereof or a complex with an organic compound of aluminum, boron, beryllium, or zinc, and

(b) a halogen-containing alcohol with

(2) a di-, tri-, or tetravalent titanium compound.

4,613,580

PROCESS FOR THE OLIGOMERIZATION OF OLEFINS AND A CATALYST THEREOF

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 23, 1985, Ser. No. 737,320

Int. Cl.[4] C08F *4/70*

U.S. Cl. 502—117 **16 Claims**

1. A catalytic composite comprising a combination of a catalytically effective amount of an alkyl aluminum compound on a porous support containing a catalytically effective amount of hydrate of an iron group metal salt in which the mole ratio of water of hydration to iron group metal is greater than 0.5:1.

4,613,581

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS P-998

Kouji Maruyama; Takeshi Nomura; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 564,789, Dec. 22, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 768,974

Claims priority, application Japan, Dec. 28, 1982, 57-227488; Dec. 28, 1982, 57-227489

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—127 **18 Claims**

1. A solid titanium containing catalyst component for the polymerization of olefins obtained by contacting, by copulverizing, a magnesium dialkoxide with a halogenated hydrocarbon having 2 or more carbon atoms, an electron donor and a tetravalent titanium halide compound with the proviso that the magnesium dialkoxide is contacted with the halogenated hydrocarbon prior to or simultaneously with the titanium halide compound.

7. The solid titanium containing catalyst component of claim 1 or 3 wherein the magnesium dialkoxide is magnesium diethoxide, the halogenated hydrocarbon is hexachloroethane, the electron donor is ethylbenzoate and the titanium halide compound is titanium tetrachloride.

4,613,582

METHOD FOR MAKING TERNARY FUEL CELL CATALYSTS CONTAINING PLATINUM COBALT AND CHROMIUM

Francis J. Luczak, Glastonbury, and Douglas A. Landsman, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 459,002, Jan. 17, 1983, Pat. No. 4,447,506. This application Jan. 30, 1984, Ser. No. 575,360

Int. Cl.[4] B01J *21/18, 23/64, 23/86*

U.S. Cl. 502—185 **6 Claims**

1. A method for making a ternary metal alloy catalyst comprising intimately contacting a finely divided noble metal supported on electrically conductive carbon-black with a solution of a compound of an element selected from transition Groups IV, V, VI and VII and a compound of cobalt, heating and reducing the intimately contacted materials in a nitrogen atmosphere to form the catalyst.

4,613,583

CATALYST FOR THE BURNING AND CONVERSION OF GASES AND HIGHER HYDROCARBONS AND METHOD FOR PRODUCING THE CATALYST

Christian Koch, Erlangen, and Erwin Erdlen, Nuernberg, both of Fed. Rep. of Germany, assignors to INSUMMA-Projektgesellschaft mit beschränkter Haftung, Nuremberg, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,552

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340682; Apr. 3, 1984, 3412289; Apr. 21, 1984, 3415075

Int. Cl.[4] B01J *21/04, 23/10, 23/78*

U.S. Cl. 502—252 **4 Claims**

1. Catalyst for the conversion of gases, higher hydrocarbons and soot, which comprises a coating containing active metal components on a porous oxidic carrier material, in which said coating contains 1 part cobalt, 1–3 parts lanthanum, 2 to 20 weight percent cerium, and 2 to 20% weight percent iron, said percentages being based on the sum of cobalt and lanthanum.

4,613,584

CATALYST FOR THE PRODUCTION OF SYNTHESIS GAS OR HYDROGEN AND PROCESS FOR THE PRODUCTION OF THE CATALYST

Michael Schneider, Ottobrunn-Riemerling; Karel Kochloefl, Moosburg, and Ortwin Bock, Landshut, all of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 665,757

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340569

Int. Cl.[4] B01J *21/06, 23/10, 23/64*

U.S. Cl. 502—304 **11 Claims**

1. A catalyst for the production of synthesis gas or hydrogen from aqueous methanol, which comprises:

A. a catalytically-active Group VIII precious metal component;

B. a carrier comprising:

1. a metal oxide or a mixture of metal oxides, wherein the metal is selected from the group consisting of cerium and titanium in admixture with chromium oxide.

4,613,585

PROCESS OF PREPARING ALUMINA FOR USE IN CATALYST CARRIER

Shizuo Takumi, Kamakura; Toshio Hashimoto, and Masaru Tatsushima, both of Isehara, all of Japan, assignors to Nikki-Universal Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 634,943
Claims priority, application Japan, Aug. 4, 1983, 58-142798
Int. Cl.[4] B01J *23/00*; C01F *7/02*
U.S. Cl. 502—355 5 Claims

1. A process of preparing an alumina catalyst carrier which comprises the steps of:

(a) simultaneously pouring an aluminum sulfate solution and a sodium aluminate solution into deionized water in a vessel and therein reacting said aluminum sulfate with said sodium aluminate, under the conditions of a pH of 6.0–8.5 and a temperature of 50°–65° C., thereby to prepare a first aqueous slurry containing an amorphous alumina hydrate,

(b) adding to said first aqueous slurry, an aqueous sodium aluminate solution in an amount sufficient to neutralize the first aqueous slurry, the sum of the amounts of sodium aluminate used in steps (a) and (b) corresponding to 0.95–1.05 equivalents of the amount of aluminum sulfate used in the step (a) thereby to prepare a second aqueous slurry having an Al_2O_3 concentration of 7 wt. % or more,

(c) filtering off the amorphous alumina hydrate contained in said second aqueous slurry to obtain a filter cake thereof, and washing the resulting filter cake firstly with a dilute aqueous ammonia solution and then with a dilute nitric acid solution, and then washing the same again with a dilute aqueous ammonia solution so as to remove sulfate anion and sodium cation impurities and to regulate the pH of the filter cake to the range of 7.5–10.5,

(d) then, without aging the filter cake, dehydrating the filter cake on a filter press and increasing its Al_2O_3 concentration to be in the range of 28–35 wt. %, and thereafter kneading the same, at a pH in the range of 7.5–10.5, in a self-cleaning type mixer for a residence time of 10 seconds or more to grow pseudoboehmite grains in a short time and thereby to obtain a dough containing those grains, and

(e) extruding the dough obtained from the step (d) to form extrudates, and thereafter drying and calcining the resulting extrudates.

4,613,586

GASTRIN RELEASING PEPTIDE-LIKE PEPTIDES

Jack D. Barchas, Stanford; Eckard Weber, San Francisco; Christopher J. Evans, Redwood City; Jaw-Kang Chang, San Carlos, all of Calif.; Robin G. Lorenz, Okeene, Okla., and Kevin A. Roth, Mountain View, Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 19, 1984, Ser. No. 602,116
Int. Cl.[4] A61K *17/43*; C07K *7/06, 7/08*
U.S. Cl. 514—13 16 Claims

1. A biologically pure polypeptide having the formula Ala-Pro-Val-Ser-Val-Gly-Gly-Gly-Thr-Val-Leu-Ala-Lys-Met-Tyr-Pro-NH_2.

4,613,587

OPHTHALMIC PREPARATIONS

Efrat Kessler, Tel-Aviv; Abraham Spierer, Bne Braq, and Shmaryahum Blumberg, Rishon Lezion, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot and Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, both of, Israel

Filed Jul. 10, 1984, Ser. No. 628,724
Claims priority, application Israel, Sep. 23, 1983, 69795
Int. Cl.[4] A61K *37/02*
U.S. Cl. 514—19 12 Claims

1. An ophthalmic pharmaceutical composition for the treatment of afflictions of the eye caused by metalloendopeptidases, which comprises an ophthalmically acceptable carrier containing 2-mercaptoacetyl L-phenylalanyl-L-leucine and gentamicin.

4,613,588

BENZALDEHYDE AND 4,6-O-BENZYLIDENE-D-GLUCOSE FOR ALLEVIATING PAIN

Takashi Katayama, Tokyo, and Tadahiko Hazato, Wako, both of Japan, assignors to Kaken Pharmaceutical Co. Ltd., Japan

Filed Jun. 28, 1985, Ser. No. 750,327
Claims priority, application Japan, Jun. 28, 1984, 59-131891
Int. Cl.[4] A61K *31/11, 31/70*
U.S. Cl. 514—23 8 Claims

1. A method of effect analgesia in humans and animals which comprises administering to a human or animal in need thereof an analgesically effective amount of benzaldehyde or 4,6-O-benzylidene-D-glucose in combination with a pharmaceutically acceptable or veterinarily acceptable carrier.

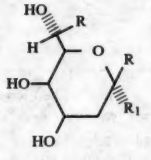
4,613,589

D-MANNO-2-OCTULOSONIC ACID DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

William Rosenbrook, Libertyville; Paul A. Lartey, and David A. Riley, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 19, 1985, Ser. No. 767,212
Int. Cl.[4] A61K *31/70*; C07H *3/08*
U.S. Cl. 514—23 4 Claims

1. A compound of the formula:



wherein R is hydrogen, methylthio, alkyl or loweralkyl; R_1 is in an alpha orientation and is a carboxylic acid for COR_3 wherein R_3 is alkoxy or —NHOH; R_2 is loweralkyl, azido or hydroxy-substituted alkyl; and pharmaceutically acceptable salts thereof.

4. A method of treating bacterial infection in a patient comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound as defined in claim 1.

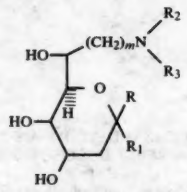
4,613,590

AMINO D-MANNO-2-OCTULOPYRANOSIDONATE CONTAINING COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

William Rosenbrook, Libertyville; Paul A. Lartey, and David A. Riley, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 19, 1985, Ser. No. 767,297
Int. Cl.[4] A61K *31/70*; C07H *5/06*
U.S. Cl. 514—23 10 Claims

1. A compound of the formula:



wherein R is hydrogen or hydroxy; R_1 is carboxylic acid or COR_4 wherein R_4 is alkoxy or NH_2; m is 1 or 2; and R_2 and R_3 are independently selected from hydrogen, loweralkyl or acyl with the proviso that R_2 and R_3 are not simultaneously acyl, and pharmaceutically acceptable salts thereof.

10. A method of treating bacterial infection in a patient comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound as defined in claim 1.

4,613,591

ADMINICULUM FOR ANTITUMOR AGENTS

Masaki Aburada; Shigefumi Takeda, both of Kawasaki; Eiko Itoh, Nagareyama; Moe Matsushita, Machida, and Eikichi Hosoya, Tokyo, all of Japan, assignors to Tsumura Juntendo Inc., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,197

Claims priority, application Japan, Aug. 23, 1982, 57-144630

Int. Cl.[4] A61K *31/71*

U.S. Cl. 514—34 **14 Claims**

1. A composition for treating tumor-bearing patients consisting essentially of (a) an effective amount of an antitumor agent selected from the group consisting of mitomycin C and doxorubicin hydrochloride and (b) an effective amount of an aqueous or aqueous organic solvent extract of a crude preparation comprising Astragali radix, Cinnamomi cortex, Rehmanniae radix, Paeoniae radix, Cnidii rhizoma, Atractylodis lanceae rhizoma, Angelicae radix, Ginseng radix, Hoelen and Glycyrrhizae radix, as active agents.

4,613,592

SKIN TREATMENT COMPOSITION

Andre J. E. Benzoni, Livry-Gargan, France, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 8, 1985, Ser. No. 689,614

Claims priority, application United Kingdom, Jan. 9, 1984, 8400462; Apr. 12, 1984, 8409548

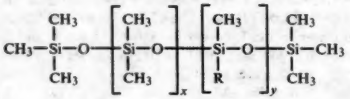
Int. Cl.[4] A61K *31/695*

U.S. Cl. 514—63 **1 Claim**

1. A process for preparing a water-in-oil emulsion suitable for topical application to human skin for the treatment of acne, which comprises in addition to water:

(i) from 2 to 30% by weight of a C_1 to C_4 alkyl lactate, or a mixture thereof;

(ii) from 15 to 50% by weight of a silicone oil ingredient comprising a dispersion in a volatile siloxane of a polymer of dimethyl polysiloxane with polyoxyethylene and/or polyoxypropylene side chains having a molecular weight of from 10,000 to 50,000, and having the structure:



where

R is

$$-[CH_2CH_2O]_a[CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HO]_bH$$

a has a value of from 9 to 115,

b has a value of from 0 to 50,

x has a value of from 133 to 673, and

y has a value of from 25 to 0.25;

(iii) from 0.5 to 10% by weight of a nonionic liquid emulsifier having an HLB value of from 1 to 7; and

(iv) from 5 to 40% by weight of a C_1 to C_4 alkanol, or a mixture thereof;

the emulsion consisting essentially of an aqueous phase forming from 10 to 98% by volume and an oily phase forming from 2 to 90% by volume; said process comprising the steps of:

(i) preparing an oily phase by mixing together the silicone oil ingredient and the nonionic liquid emulsifier;

(ii) homogenising the oily phase with an aqueous phase comprising an aqueous solution of an alkanol buffered to a pH value of from 4 to 5.5, in the absence of alkyl lactate; and

(iii) subsequently incorporating with mixing the alkyl lactate and the alkanol so as to form the water-in-oil emulsion.

4,613,593

THERAPEUTIC AND PREVENTIVE AGENT CONTAINING DOLICHOL

Isao Yamatsu; Takeshi Suzuki; Shinya Abe; Kouji Nakamoto; Akiharu Kajiwara; Kouichi Katayama; Hajime Tsunoda; Manabu Murakami; Hideki Ono, and Kouji Yamada, all of Ibaragi, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,875

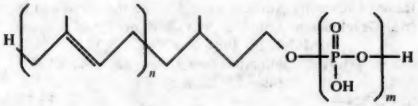
Claims priority, application Japan, Dec. 26, 1983, 58-244229

Int. Cl.[4] A61K *31/66, 31/045*

U.S. Cl. 514—106 **4 Claims**

1. A method of treating hyperlipidemia or arteriosclerosis, or improving lipometabolism, which comprises administering to a subject requiring such treatment, a therapeutically effective amount of a composition comprising a pharmaceutical carrier and an effective amount of at least one substance selected from the group consisting of compounds having the formulas

and



wherein n is an integer of 14 to 24, and m is an integer of 1 to 3.

4,613,594

FLUORINATED VITAMIN D_3 COMPOUNDS

Enrico Baggiolini, North Caldwell; Giacomo Pizzolato, Glen Ridge; Milan Uskokovic, Upper Montclair, and Gary Truitt, Passaic, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 16, 1984, Ser. No. 672,059
Int. Cl.[4] C07J 9/00
U.S. Cl. 514—167 14 Claims

1. 26,26,26,27,27,27-Hexafluoro-1α,25-dihydroxy-Δ^{22}-cholecalciferol.

4. A pharmaceutical composition suitable for oral administration said composition comprising a minor, effective amount of 26,26,26,27,27,27-hexafluoro-1α,25-dihydroxy-Δ^{22}-cholecalciferol and a major amount of a conventional pharmaceutical carrier material suitable for oral administration.

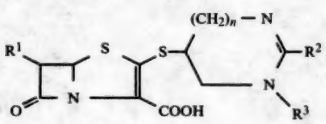
4,613,595

PENEM DERIVATIVES, AND COMPOSITION CONTAINING THEM

Tetsuo Miyadera; Yukio Sugimura; Toshihiko Hashimoto; Teruo Tanaka; Kimio Iino; Tomoyuki Shibata, and Shinichi Sugawara, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,570
Claims priority, application Japan, May 14, 1982, 57-81067
Int. Cl.[4] C07D 499/00; A61K 31/425
U.S. Cl. 514—195 18 Claims

1. A compound of formula (I):



(I)

wherein:

R^1 represents a C_1–C_4 alkyl group or a C_1–C_3 alpha-hydroxyalkyl group;

R^2 represents a hydrogen atom, an alkyl group, a cycloalkyl group or an alkyl group having at least one substituent selected from C_1–C_4 alkoxy groups, cyano groups, alkoxycarbonyl groups and halogen atoms;

R^3 represents a hydrogen atom or an alkyl group; and

n is 1 or 2;

and pharmaceutically acceptable salts and esters thereof.

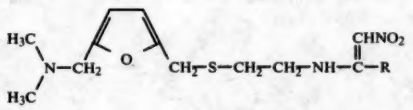
4,613,596

AMINO METHYL FURANS AND PHARMACEUTICAL COMPOSITIONS

Adolfo Moroni, Brescia, Italy, assignor to Magis Farmaceutrici s.r.l., Brescia, Italy

Continuation of Ser. No. 536,730, Sep. 28, 1983, abandoned. This application Dec. 16, 1985, Ser. No. 808,375
Claims priority, application Italy, Apr. 27, 1982, 20954 A/82
Int. Cl.[4] A61K 31/445, 31/40; C07D 405/12
U.S. Cl. 514—210 18 Claims

1. Compounds of formula (I)



(I)

where R is a piperidino, 4-methylpiperidino, 4-benzylpiperidino, ethyleneimino, cyclopropyleneimino, hexamethyleneimino, or pyrrolidino, or their pharmaceutically acceptable salts.

7. A compound as claimed in claim 1, characterised by being 1-N-[2-[[5-(dimethylamino)methyl]furfuryl]thio]ethyl]-amino-1-cyclopropyleneimino-2-nitroethene.

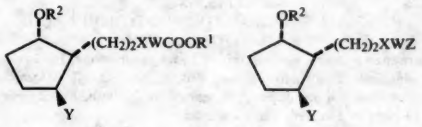
4,613,597

AMINOCYCLOPENTANES AND THEIR PREPARATION AND PHARMACEUTICAL FORMULATION

Eric W. Collington, Welwyn; Peter Hallett; Christopher J. Wallis, both of Royston, and Norman F. Hayes, Hitchin, all of England, assignors to Glaxo Group Limited, London, England

Filed Sep. 5, 1984, Ser. No. 647,537
Claims priority, application United Kingdom, Sep. 6, 1983, 8323830; Jun. 6, 1984, 8414676
Int. Cl.[4] A61K 31/55; C07D 295/08, 295/10
U.S. Cl. 514—211 20 Claims

1. A compound of the formula (1a) or 1(b)



(1a) (1b)

wherein

R^1 is a hydrogen atom, or a C_{1-6} alkyl or C_{7-10} aralkyl group;

W is straight or branched C_{1-7} alkylene;

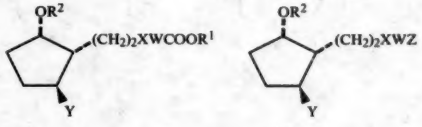
X is cis or trans —CH=CH—;

Y is a saturated heterocyclic amino group (attached to the cyclopentane ring via the nitrogen atom) which is selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, thiomorpholino, 1,1-dioxothiomorpholino, homomorpholino and hexamethyleneimino in which the ring carbon atoms can be substituted by methyl, ethyl or butyl and a second nitrogen atom in the ring, if present, can be substituted by methyl, ethyl, butyl, hexyl, benzyl or phenethyl;

R^2 is (i) straight or branched C_{1-5} alkyl substituted by (a) phenyl (optionally substituted by C_{1-6} alkyl, C_{5-7} cycloalkyl, phenylalkyl having a C_{1-3} alkyl portion, thienyl, phenyl (optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy, or phenyl)), (b) thienyl (optionally substituted by C_{5-7} cycloalkyl or phenyl (optionally substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen)), or (c) naphthyl (optionally substituted by C_{1-4} alkyl or C_{1-4} alkoxy) or (ii) cinnamyl; and Z is $—CH_2OH$, —CHO or $—CONHR^4$ where

R^4 is a hydrogen atom or a methyl group; and the physiologically acceptable salts and solvates thereof.

18. A pharmaceutical composition comprising a compound of the formula (1a) or 1(b)



(1a) (1b)

wherein

R^1 is a hydrogen atom, or a C_{1-6} alkyl or C_{7-10} aralkyl group;

W is straight or branched C_{1-7} alkylene;

X is cis or trans —CH=CH—;

Y is a saturated heterocyclic amino group (attached to the cyclopentane ring via the nigrogen atom) which is selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, thiomorpholino, 1,1-dioxothiomorpholino, homomorpholino and hexamethyleneimino in which the ring carbon atoms can be sub-

stituted by methyl, ethyl or butyl and a second nitrogen atom in the ring, if present, can be substituted by methyl, ethyl, butyl, hexyl, benzyl or phenethyl;

R^2 is (i) straight or branched C_{1-5} alkyl substituted by (a) phenyl (optionally substituted by C_{1-6} alkyl, C_{5-7} cycloalkyl, phenylalkyl having a C_{1-3} alkyl portion, thienyl, phenyl (optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy, or phenyl)), (b) thienyl (optionally substituted by C_{5-7} cycloalkyl or phenyl (optionally substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen)), or (c) naphthyl (optionally substituted by C_{1-4} alkyl or C_{1-4} alkoxy) or (ii) cinnamyl; and

Z is $-CH_2OH$, $-CHO$ or $-CONHR^4$ where R^4 is a hydrogen atom or a methyl group;

and the physiologically acceptable salts and solvates thereof together with one or more pharmaceutical carriers.

4,613,598

PIPERAZINE DERIVATIVES AND THEIR ACID ADDITION SALTS

Harukazu Fukami, Kyoto; Shinya Inoue, Yokohama; Issei Nitta, Machida; Kenichiro Nakao, Tokyo, and Ryoji Kikumoto, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

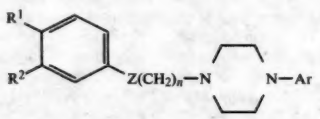
Filed Mar. 6, 1985, Ser. No. 708,641

Claims priority, application Japan, Mar. 13, 1984, 59-47964; Mar. 13, 1984, 59-47965; Mar. 13, 1984, 59-47966

Int. Cl.[4] A61K *31/55*; C07D *417/10*

U.S. Cl. 514—211 **9 Claims**

1. A piperazine compound of formula (I):

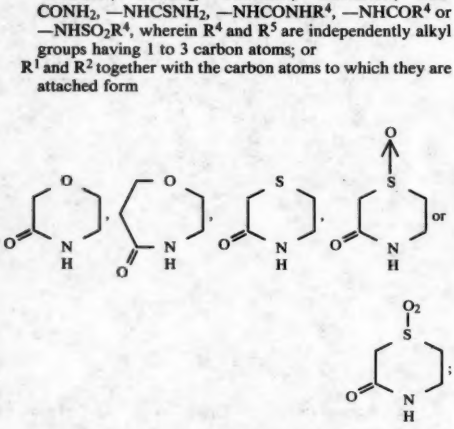


wherein

R^1 is —OH, $-OR^3$, $-SR^3$, $-SOR^3$ or $-SO_2R^3$, wherein R^3 is an alkyl group having 1 to 3 carbon atoms;

R^2 is $-SO_2NH_2$, $-SO_2NHR^4$, $-SO_2NR^4R^5$, —COOH, $-COOR^4$, $-CONH_2$, $-CONHR^4$, $-CONR^4R^5$, $-NHCONH_2$, $-NHCSNH_2$, $-NHCONHR^4$, $-NHCOR^4$ or $-NHSO_2R^4$, wherein R^4 and R^5 are independently alkyl groups having 1 to 3 carbon atoms; or

R^1 and R^2 together with the carbon atoms to which they are attached form



Z is —CO— or —CH(OH)—;

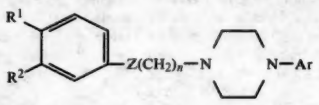
Ar is pyridyl, phenyl, or halogen, C_{1-3} alkyl or C_{1-3} alkoxy substituted phenyl;

n is an integer of 3 to 5; and

therapeutically active acid addition salts thereof.

7. A pharmaceutical composition which is effective in the treatment of hypertension, comprising:

at least one piperazine compound of the formula (I):



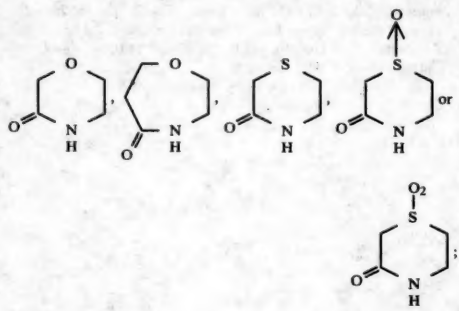
[I]

wherein

R^1 is —OH,—OR^3, —SR^3, —SOR^3 or —SO_2R^3, wherein R^3 is an alkyl group having 1 to 3 carbon atoms;

R^2 is $-SO_2NH_2$, $-SO_2NHR^4$, $-SO_2NR^4R^5$, —COOH, $-COOR^4$, $-CONH_2$, $-CONHR^4$, $-CONR^4R^5$, $-NHCONH_2$, $-NHCSNH_2$, $-NHCONHR^4$, $-NHCOR^4$ or $-NHSO_2R^4$, wherein R^4 and R^5 are independently alkyl groups having 1 to 3 carbon atoms; or

R^1 and R^2 together with the carbon atoms to which they are attached form



Z is —CO— or —CH(OH)—;

Ar is pyridyl, phenyl, or halogen, C_{1-3} alkyl or C_{1-3} alkoxy substituted phenyl;

n is an integer of 3 to 5; and

therapeutically active acid addition salts thereof in combination with a pharmaceutical acceptable carrier.

4,613,599

METHOD OF TREATING THROMBOTIC DISEASE WITH PYRIDAZINONES

Richard Göschke, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

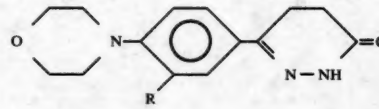
Continuation of Ser. No. 608,536, May 9, 1984, abandoned, which is a continuation of Ser. No. 490,993, May 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 352,739, Feb. 6, 1982, abandoned. This application Jul. 24, 1985, Ser. No. 758,833

Claims priority, application Switzerland, Mar. 4, 1981, 1443/81

Int. Cl.[4] A61K *31/535*

U.S. Cl. 514—234 **8 Claims**

1. A method for the treatment of a thrombotic disease comprising administering to a living body suffering from a thrombotic disease an antithrombotic effective amount of a compound of the formula



wherein R is fluorine, bromine, iodine, amino, acetylamino, methyl, cyano, methoxy, or trifluoromethyl or tautomeric

forms thereof and pharmaceutically acceptable acid addition salts thereof when R is amino.

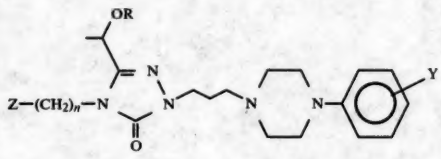
4,613,600

ANTIDEPRESSANT 1,2,4-TRIAZOLONE COMPOUNDS

Richard E. Gammans; David W. Smith, both of Evansville, and Joseph P. Yevich, Newburgh, all of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Sep. 30, 1983, Ser. No. 538,027
Int. Cl.[4] C07D *249/00;* A61K *31/41*
U.S. Cl. 514—252 13 Claims

1. A compound in purified pharmaceutically acceptable form having formula I



I

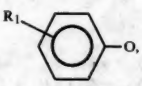
or a pharmaceutically acceptable salt thereof wherein

R is hydrogen, lower (C_1–C_4) alkyl, lower alkylcarbonyl, phenyl-lower alkyl, phenylcarbonyl, and phenyl-lower alkylcarbonyl;

n is 2–4;

Y is halogen and trifluoromethyl;

Z is hydrogen and



wherein R^1 is hydrogen, halogen, lower alkoxy and trifluoromethyl.

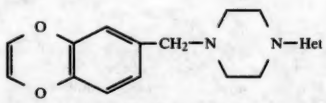
4,613,601

(1-BENZODIOXIN-6-YLMETHYL)-4-SUBSTITUTED PIPERAZINES HAVING ANTIPSYCHOTIC ACTIVITY

Gilbert Regnier, Chatenay-Malabry, and Jean-Claude Poignant, Bures sur Yvette, both of France, assignors to Adir, S.A.R.L., Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 459,256, Jan. 19, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,278
Claims priority, application France, Jan. 21, 1982, 82 00870
Int. Cl.[4] C07D *401/04, 403/04;* A61K *31/495, 31/505*
U.S. Cl. 514—252 5 Claims

1. A compound selected from the group consisting of: benzodioxine compounds of the formula:



(I)

in which Het is a heterocyclic radical selected from the group consisting of pyrimidin-2-yl and 2-pyridyl; and

physiologically tolerable addition salts thereof.

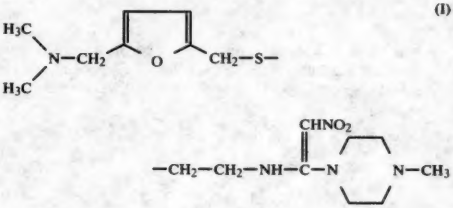
4,613,602

RANITIDINE DERIVATIVE USEFUL IN THE TREATMENT OF ULCER

Adolfo Moroni, Brescia, Italy, assignor to Magis Farmaceutici s.r.l., Brescia, Italy

Filed May 31, 1985, Ser. No. 739,992
Claims priority, application Italy, Jun. 12, 1984, 21358 A/84
Int. Cl.[4] A61K *31/495;* C07D *405/12*
U.S. Cl. 514—252 10 Claims

1. Compound of formula:



(I)

1-N—[2-[[5-[(dimethylamino)-methyl]-furfuryl]-thio]-ethyl]-amino-1-]4-methyl-piperazino]-2-nitroethene, and its pharmaceutically acceptable salts.

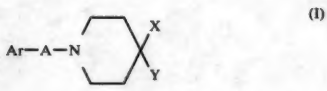
4,613,603

COMPOUNDS WITH A NITROGEN-CONTAINING HETEROCYCLIC NUCLEUS, AND DRUGS IN WHICH THEY ARE PRESENT

Kathleen Biziere, Clapiers; Jean-Pierre Chambon, Montarnaud, and André Hallot, Saint-Gely-du-Fesc, all of France, assignors to Sanofi, Paris, France

Filed Jul. 8, 1985, Ser. No. 752,740
Claims priority, application France, Jul. 11, 1984, 84 11039
Int. Cl.[4] C07D *401/04;* A61K *31/53, 31/505, 31/445*
U.S. Cl. 514—242 11 Claims

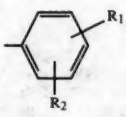
1. A compound with a nitrogen-containing heterocyclic nucleus, of the formula:



(I)

in which:

Ar represents a group



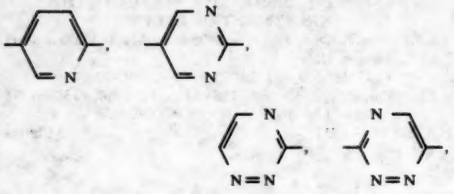
in which:

R_1 represents a hydrogen atom, a halogen atom, a trifluoromethyl group, a lower alkyl group (1 to 4 carbon atoms), a lower alkoxy group (1 to 4 carbon atoms), a nitro group, a cyano group or a hydroxyl group, and

R_2 represents H or a halogen atom, or alternatively

Ar represents a naphthyl group optionally substituted by a halogen atom;

A represents one of the following nitrogen-containing heterocyclic nuclei:

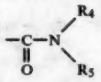


and

X and Y, taken separately, represent a hydrogen atom in one case and a group —OR_3 in the other, R_3 representing:

a hydrogen atom,

a group



in which R_4 represents hydrogen or a lower alkyl group (1 to 4 carbons) and R_5 represents a lower alkyl group, or alternatively

represents a 4-hydroxypiperidino group, or

a group

in which R_5 is as defined above, or alternatively

X and Y, taken together, form an oxo group (=O), and addition salts of the said compound with mineral or organic acids.

4,613,604

HYDROXYMETHYL DERIVATIVES OF 5-BENZYLACYCLOURIDINE AND 5-BENZOYLOXYBENZYLACYCLOURIDINE AND THEIR USE AS POTENTIATORS FOR 5-FLUORO-2'-DEOXYURIDINE

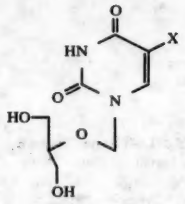
Shih H. Chu, Barrington; Paul Calabresi, West Barrington; Ming Y. W. Chu, Barrington; Mahmoud H. el Kouni, Providence; Fardos N. M. Naguib, Providence, and Sungman Cha, Providence, all of R.I., assignors to Brown University Research Foundation, Providence, R.I.

Filed Jul. 31, 1985, Ser. No. 761,208

Int. Cl.[4] A61K *31/505;* **C07D** *239/54*

U.S. Cl. 514—274 **8 Claims**

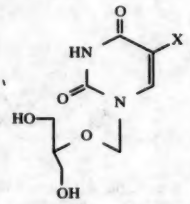
1. A compound of the Formula (I):



(I)

where X is a benzyl group or a benzyloxybenzyl group.

4. A pharmaceutical preparation comprising a uridine phosphocylase inhibiting effective amount of the compound of Formula (I):



(I)

where X is a benzyl group or a benzyloxybenzyl group and a pharmaceutically acceptable carrier.

4,613,605

PERFLUORO-1-AZATRICYCLIC AMINES AS BLOOD SUBSTITUTES

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita; Yoshihisa Inoue, Kyoto; Youichiro Naito, Hirakata, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

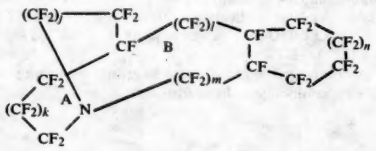
Division of Ser. No. 505,322, Jun. 17, 1983, Pat. No. 4,542,147. This application Jul. 5, 1985, Ser. No. 751,948

Claims priority, application Japan, Aug. 7, 1982, 57-137663; Aug. 7, 1982, 57-137664; Aug. 7, 1982, 57-137665

Int. Cl.[4] A61K *31/445;* **C07D** *453/00, 487/08*

U.S. Cl. 514—294 **24 Claims**

1. A perfluoro-1-azatricyclic amine compound represented by the formula:



wherein j, k, l and m are each zero or 1 so as to make one of the rings A and B to be 6 membered and the other 5 or 6 membered; n is zero, 1 or 2; any carbon of the formula being optionally substituted with one trifluoromethyl group.

22. A composition for use as a blood substitute or infusion fluid which composition is an aqueous emulsion of a compound of the formula given and defined in claim **1.**

4,613,606
TETRAHYDROISOQUINOLINE DERIVATIVES

Robin Clark, Palo Alto; Joseph M. Muchowski, Sunnyvale; Fang-Ting Chiu, Union City; John O. Gardner, Los Altos, and Jacob Berger, Los Altos Hills, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

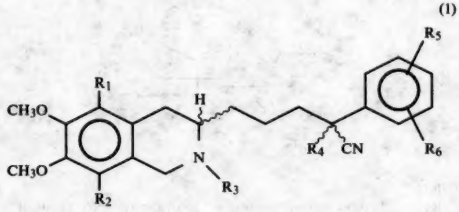
Filed Dec. 2, 1985, Ser. No. 803,464
Int. Cl.[4] A61K *31/47;* **C07D** *217/20*
U.S. Cl. 514—307 **10 Claims**

9. A pharmaceutical composition for treating angina, hypertension or congestive heart failure, comprising

a pharmaceutically acceptable carrier; and

an effective amount of a compound of formula 1,

(I)



wherein

R_1 and R_2 are each independently —H or lower alkoxy;

R_3 and R_4 are each independently lower alkyl; and

R_5 and R_6 are each —OCH_3, or together form —OCH_2O— or —OCH_2CH_2O—.

4,613,607
MEDICAMENTS BASED ON DERIVATIVES OF 1-(4-QUINOLYL)-2-(4-PIPERIDYL)-ETHANOL OR 1-(4-QUINOLYL)-3-(4-PIPERIDYL)-PROPANOL

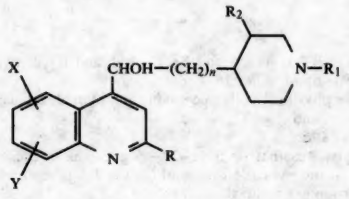
Claude G. A. Gueremy, Houilles; Michel A. P. Mestre, Paris, and Christian L. A. Renault, Taverny, all of France, assignors to Pharmuka Laboratoires, Gennevilliers, France

Continuation of Ser. No. 324,713, Nov. 24, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 537,157
Claims priority, application France, Dec. 5, 1980, 80 25829
Int. Cl.[4] A61K *31/47;* **C07D** *215/14*
U.S. Cl. 514—314 **21 Claims**

1. Medicaments useful as antiarrhythmics containing an active substance and a pharmaceutically acceptable vehicle, in which the active substance is

(1) a compound corresponding to the formula:

(I)



wherein

(a) X and Y, which are the same or different, are fixed in position 5, 6, 7 or 8 on the quinoline ring and each represents hydrogen or alkoxy having 1 to 3 carbon atoms, R represents alkyl having 1 to 4 carbon atoms, and R_1 and R_2 represent hydrogen; or

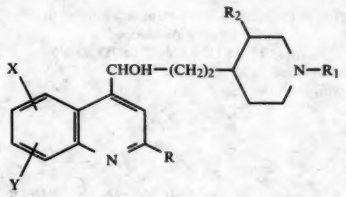
(b) X and Y, which are the same or different, are fixed in position 5, 6, 7 or 8 on the quinoline ring and each represents hydrogen or alkoxy having 1 to 3 carbon atoms, R and R_1 represent hydrogen and R_2 represents alkyl having 1 to 2 carbon atoms or alkenyl having 2 to 4 atoms or

(2) a mixture of stereoisomeric compounds corresponding to formula (I) or

(3) a salt of said compound with a pharmaceutically acceptable acid or

(4) a mixture of stereoisomeric compounds with a pharmaceutically acceptable acid.

17. The racemic, enantiomeric or stereoisomeric compounds of formula:



in which X and Y, which are the same or different, are fixed in position 5, 6, 7 or 8 on the quinoline ring and each represents hydrogen or alkoxy having 1 to 3 carbon atoms, R represents alkyl having 1 to 4 carbon atoms, and R_1 and R_2 represent hydrogen.

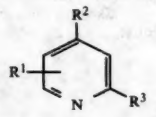
20. A process for the treatment or prevention of arrhythmia in a human which comprises orally administering to said human a medicament according to claim **1**, the dose of active substance administered being from 50 to 800 mg per 24 hours.

4,613,608
MONO OR DINITROXYALKYL PYRIDINES AND VASODILATING COMPOSITIONS

Ikuo Ueda, Uenohigashi; Daizo Morino, Higashishinmachi, and Koichi Takimoto, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 515,653, Jul. 20, 1983, Pat. No. 4,540,701. This application May 8, 1985, Ser. No. 731,893
Claims priority, application United Kingdom, Jul. 26, 1982, 8221592
Int. Cl.[4] C07D *213/53;* **A61K** *31/44*
U.S. Cl. 514—357 **8 Claims**

1. A pyridylalkyl nitrate compound of the formula:



wherein

R^1 is hydrogen or lower alkyl,

one of R^2 and R^3 is mono (or di)-nitroxy(lower)alkyl and the other of R^2 and R^3 is hydrogen,

and pharmaceutically acceptable salts thereof.

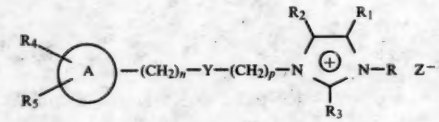
8. A vasodilating, pharmaceutical composition comprising an effective amount of a compound of claim **1** or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,613,609
ANTIARRHYTHMIC IMIDAZOLIUMS

Julius Diamond, Mountain Lakes, N.J.; William C. Lumma, Jr., Pennsburg, Pa.; Thomas K. Morgan, Jr., and Ronald A. Wohl, both of Morris Plains, N.J., assignors to Schering A. G., Berlin, Fed. Rep. of Germany

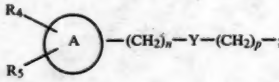
Continuation-in-part of Ser. No. 513,143, Jul. 12, 1983, Pat. No. 4,581,370. This application Nov. 27, 1984, Ser. No. 675,172
Claims priority, application European Pat. Off., Jul. 9, 1984, 84108015.3
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] A61K *31/415*; C07D *233/58*
U.S. Cl. 514—396 35 Claims

1. A compound of the formula:



wherein

R=straight or branched chain alkyl having 1–12 carbon atoms, cycloalkyl(lower)alkyl of up to six carbon atoms in the ring,



R_1,R_2,R_3=hydrogen, a straight chain alkyl group of 1–4 carbon atoms,

R_4,R_5=hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy, cyano, nitro, carbamoyl, lower alkylcarbamoyl, lower alkanoylamido, sulfamoyl, lower alkyl sulfamoyl which may be substituted by phenyl or lower alkoxy on the alkyl chain, sulfamoylamino, N-lower alkylsulfamoylamino, lower alkylsulfonamido, lower alkylsulfonamido which may be substituted by phenyl or lower alkoxy on the alkyl chain, trifluoromethanesulfonamido, ureido, N-lower alkylureido or when taken together on adjacent carbon atoms of the ring to which they are attached may be joined to form of the ring to which they are attached may be joined to from the methylene dioxy moiety;

R_6=hydrogen, halogen, hydroxy, straight chain alkyl of 1–6 carbon atoms, lower alkoxy, cyano and carbamoyl;

A=phenyl or naphthyl;

n=0–2,

p=1–5,

t=1–5,

Y=methylene;

with the proviso that:

when the sum of the carbon atoms in the chain n, Y, p is 2 than both R_4 and R_5 cannot be hydrogen;

Z^-=halide, tosylate, sulfate, phosphate, methanesulfonate, or a molecular compound of the foregoing quaternary salts with an aromatic dicarboxylic acid.

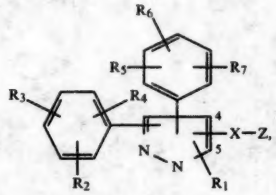
35. The method for the treatment of cardiac arrhythmia in a mammalian subject which comprises administering to said subject an amount effective for the suppression of said arrhythmia of a compound according to claim 1.

4,613,610
CHOLESTEROL BIOSYNTHESIS INHIBITING PYRAZOLE ANALOGS OF MEVALONOLACTONE AND ITS DERIVATIVES

James R. Wareing, Randolph, N.J., assignor to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

Continuation-in-part of Ser. No. 623,393, Jun. 22, 1984, abandoned. This application Jun. 6, 1985, Ser. No. 741,903
Int. Cl.[4] A61K *31/415*; C07D *231/12, 405/06*
U.S. Cl. 514—406 27 Claims

1. A compound of the formula



wherein

R_1 is C_{1-6}alkyl not containing an asymmetric carbon atom,

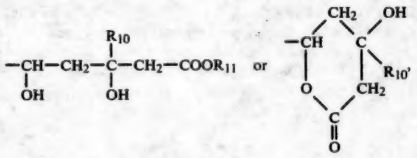
each of R_2 and R_5 is independently hydrogen, C_{1-3}alkyl, n-butyl, i-butyl, t-butyl, C_{1-3}alkoxy, n-butoxy, i-butoxy, trifluoromethyl, fluoro, chloro, phenyl, phenoxy or benzyloxy,

each of R_3 and R_6 is independently hydrogen, C_{1-3}alkyl,C_{1-3}alkoxy, trifluoromethyl, fluoro, chloro, phenoxy or benzyloxy,

each of R_4 and R_7 is independently hydrogen, C_{1-2} alkyl, C_{1-2}alkoxy, fluoro or chloro, with the provisos that not more than one of R_2 and R_3 is trifluoromethyl, not more than one of R_2 and R_3 is phenoxy, not more than one of R_2 and R_3 is benzyloxy, not more than one of R_5 and R_6 is trifluoromethyl, not more than one of R_5 and R_6 is phenoxy, and not more than one of R_5 and R_6 is benzyloxy,

X is $-(CH_2)_m-$, $-CH=CH-$, $-CH=CH-CH_2-$ or $-CH_2-CH=CH-$, wherein m is 0, 1, 2 or 3, and

Z is



wherein R_{10} is hydrogen or C_{1-3}alkyl, and R_{11} is hydrogen, R_{12} or M, wherein

R_{12} is a physiologically acceptable and hydrolyzable ester group, and

M is a cation,

with the provisos that (i) the —X—Z group is in the 4- or 5-position of the pyrazole ring, and (ii) the R_1 group and the —X—Z group are ortho to each other.

2. A compound according to claim 1 wherein M is a pharmaceutically acceptable cation.

21. A pharmaceutical composition comprising an effective amount of a compound according to claim 2 and a pharmaceutically acceptable carrier, said effective amount being an amount effective for inhibiting cholesterol biosynthesis in a mammal.

23. A method of treating atherosclerosis comprising administering to a mammal in need of such treatment an effective amount of a compound according to claim 2, said effective amount being an amount effective for the treatment of atherosclerosis.

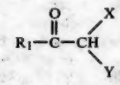
4,613,611

METHOD OF TREATING DIABETES MELLITUS USING ARYLGLYOXALS

Middleton B. Floyd, Jr., Suffern, and Jo A. Goidl, Spring Valley, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 14, 1983, Ser. No. 542,099
Int. Cl.[4] A61K *31/38, 31/34*
U.S. Cl. 514—443 39 Claims

1. A method of treating diabetes mellitus in a mammal in need of such treatment which comprises administering to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R_1 is selected from the group consisting of 1-naphthyl, 2-naphthyl, 5-indanyl, 5,6,7,8-tetrahydro-2-naphthyl, 2-benzofuranyl, benzo[b]thiophene, 2,3-dihydro-5-benzofuranyl, xanthenyl, o-terphenyl, 5-p-chlorophenyl-2-furanyl, mono- and di-substituted thiophene wherein the substituents are halogen or (C_1–C_3)alkyl; X and Y may be the same or different and are independently selected from the group consisting of hydroxy and —SO_3Q wherein Q is an alkali metal or alkaline earth metal with the proviso that X and Y taken together may represent oxygen; and the hydrates thereof.

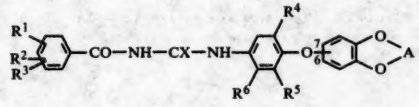
4,613,612

BENZOYLUREAS

Wilhelm Sirrenberg, Sprockhövel; Albrecht Marhold, Leverkusen, and Benedikt Becker, Mettmann, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,745
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431221
Int. Cl.[4] A01N *43/32;* C07D *319/20*
U.S. Cl. 514—456 16 Claims

1. A compound of the formula



in which

A is —CF_2—CF_2—, —CF_2—CHF— or —CF_2—CFCl—,

X is oxygen or sulphur,

R^1, R^2 and R^3 each independently is hydrogen, halogen or alkyl,

R^4 and R^5 each independently is hydrogen, halogen, alkyl or halogenoalkyl, and

R^6 is hydrogen, halogen or alkyl.

11. A method of combating insects or acarids which comprises applying thereto or to a habitat thereof an insecticidally or acaricidally effective amount of a compound according to claim 1.

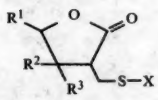
4,613,613

γ-BUTYROLACTONE DERIVATIVES, PROCESS FOR PREPARING THE SAME AND IMMUNOMODULATING COMPOSITIONS CONTAINING THE SAME AS ACTIVE INGREDIENTS

Tomei Oguri; Yasuhiro Morinaka, and Shuichiro Kadowaki, all of Ami, Japan, assignors to Mitsubishi Yuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,979
Claims priority, application Japan, Sep. 13, 1983, 58-167521
Int. Cl.[4] A61K *31/365, 31/34;* C07D *307/10, 307/26*
U.S. Cl. 514—461 8 Claims

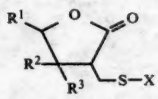
1. A γ-butyrolactone derivative represented by the following formula:



wherein R^1 represents a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a phenyl group; R^2 and R^3 may be the same or different and each represents a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 3–10 carbon atoms, a benzyl group, a phenyl group, a phenyl group substituted with a substituent selected from the group consisting of a halogen atom, an alkoxy group having 1–5 carbon atoms, a nitro group, an amino group, an alkyl group having 1–4 carbon atoms, a nitrile group and an alkoxycarbonyl group having 2–6 carbon atoms; R^2 and R^3 may be linked to form an alkylene group having 4–6 carbon atoms; X represents a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 3–10 carbon atoms, a benzyl group or a substituent represented by the formula

wherein R^4 represents a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 3–10 carbon atoms, a benzyl group, a phenyl group or a phenyl group substituted with a substituent selected from the group consisting of a halogen atom, an alkoxy group having 1–5 carbon atoms, a nitro group, an alkylthio group having 1–5 carbon atoms, a nitrile group, an alkoxycarbonyl group having 2–6 carbon atoms and an alkyl group having 1–4 carbon atoms or a salt thereof.

5. An immunomodulating composition which comprises a pharmaceutically acceptable carrier and as an active ingredient an immunomodulating effective amount of a γ-butyrolactone derivative represented by the formula



wherein R^1 represents a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a phenyl group; R^2 and R^3 may be the same or different and each represents a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 3–10 carbon atoms, a benzyl group, a phenyl group, a phenyl group substituted with a substituent selected from the group consisting of a halogen atom, an alkoxy group having 1–5 carbon atoms, a nitro group, an amino group, an alkyl group having 1–4 carbon atoms, a nitrile group and an alkoxycarbonyl group having 2–6 carbon atoms; R^2 and R^3 may be linked to form an alkylene group

having 4–6 carbon atoms; X represents a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 3–10 carbon atoms, a benzyl group or a substituent represented by the formula

wherein R^4 represents a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 3–10 carbon atoms, a benzyl group, a phenyl group or a phenyl group substituted with a substituent selected from the group consisting of a halogen atom, an alkoxy group having 1–5 carbon atoms, a nitro group, an alkylthio group having 1–5 carbon atoms, a nitrile group, an alkoxycarbonyl group having 2–6 carbon atoms and an alkyl group having 1–4 carbon atoms or a salt thereof.

4,613,614

PROSTAGLANDIN I_2 ESTER AND FAT EMULSION CONTAINING THE SAME

Chikara Fukaya, Osaka; Youichiro Naito, Yawata, and Kazumasa Yokoyama, Toyonaka, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

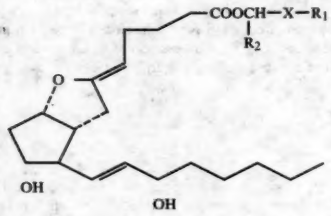
Filed Jun. 29, 1984, Ser. No. 626,422

Claims priority, application Japan, Jul. 5, 1983, 58-122900

Int. Cl.[4] A61K *31/74*; C07D *307/93*

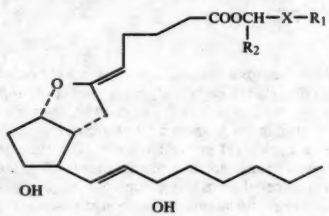
U.S. Cl. 514—469 **15 Claims**

1. A prostaglandin I_2 ester represented by the formula



wherein R_1 denotes an alkyl group having 1 to 20 carbon atoms; R_2 denotes a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; and X denotes a group represented by the formula

8. A pharmaceutical fat emulsion comprising a physiologically acceptable emulsifier, water and particles of a vegetable oil containing an effective amount of at least one ester of prostaglandin I_2 of the formula



where R_1 denotes an alkyl group having 1 to 20 carbon atoms; R_2 denotes a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; and X denotes a group represented by the formula

---

4,613,615

DITHIOCARBAMATE PLANT FUNGICIDES

Gyula Szilágyi, Miskolc; Csaba Tar, Kazincbarcika; Mariann Bendly, Kazincbarcika; Erzsébet Dienes née, Mezo, Kazincbarcika; Gábor Boda, Kazincbarcika, and János Csuták, Kazincbarcika, all of Hungary, assignors to Borsodi Vegyi Kombinat, Kazincbarcika, Hungary

PCT No. PCT/HU83/00017, § 371 Date May 21, 1984, § 102(e) Date May 21, 1984, PCT Pub. No. WO83/03603, PCT Pub. Date Oct. 27, 1983

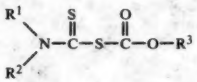
PCT Filed Apr. 20, 1983, Ser. No. 568,210

Claims priority, application Hungary, Apr. 20, 1982, 1205/82

Int. Cl.[4] A01N *47/10*; C07C *155/08*

U.S. Cl. 514—478 **7 Claims**

1. A compound of the Formula (I)



wherein

R^1 is methyl, ethyl, allyl, dimethylamino-propyl, isononyloxypropyl, methoxyethyl, ethoxypropyl, cyclohexyl, or butoxypropyl;

R^2 is hydrogen, methyl, ethyl or allyl; and

R^3 is C_1–C_4 alkyl.

6. A method of treating a cultivated plant against fungal infection which comprises the step of treating the plant with a fungicidally effective amount of the compound of the Formula (I) as defined in claim **1**.

4,613,616

POLYMERIC IRON CHELATORS

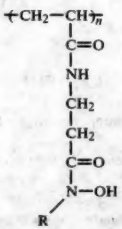
Anthony Winston, and D. V. P. R. Varaprasad, both of Morgantown, W. Va., assignors to Research Corporation, New York, N.Y.

Filed Jul. 20, 1984, Ser. No. 632,763

Int. Cl.[4] C07C *81/04*; C02F *1/42*; G21F *9/04*; B01D *15/04*

U.S. Cl. 514—507 **8 Claims**

1. An iron chelator comprising a polymeric hydroxamic acid of the following general formula:



wherein R is hydrogen or lower alkyl and n is about 40 to about 300 or more.

4,613,617
SYNERGISTIC INSECTICIDAL COMPOSITIONS CONTAINING DIONE ESTERS

Anthony A. Sousa, St. Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

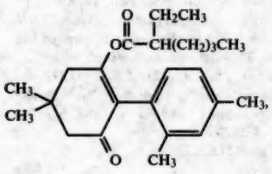
Continuation of Ser. No. 277,731, Jun. 26, 1981, abandoned. This application Apr. 23, 1985, Ser. No. 724,960

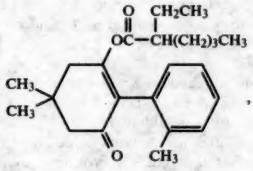
Int. Cl.⁴ A01N *37/34, 53/00*

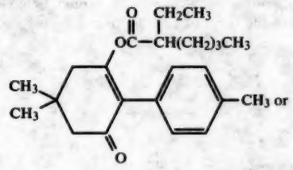
U.S. Cl. 514—521 **10 Claims**

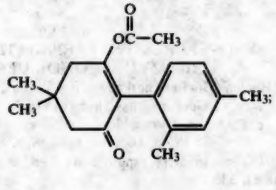
1. An insecticidal composition consisting essentially of an acceptable carrier and as the active toxicant therefor, a mixture of:

(a) a first compound selected from



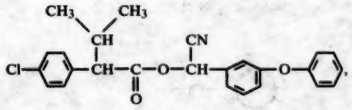


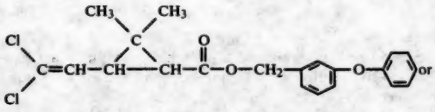




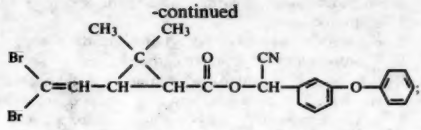
and

(b) a second compound selected from





-continued



said first and second compound are present in a respective weight ratio of from about 500:1 to about 1:1.

4,613,618
METHOD FOR TREATING DISORDERS OF LIPID METABOLISM USING BENZENE SULFONAMIDES

Patrick Choay, Paris; Pierre Roger, Montigny les Bretonneaux, and Dominique Olliero, Montpellier, all of France, assignors to Choay S.A., Paris, France

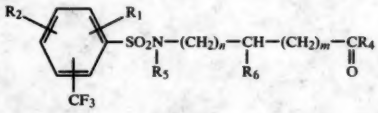
Filed Jun. 16, 1982, Ser. No. 388,964

Claims priority, application France, Jun. 16, 1981, 81 11858; Jun. 16, 1981, 81 11859

Int. Cl.⁴ A61K *31/19, 31/20, 31/215*

U.S. Cl. 514—538 **19 Claims**

1. A method for treating disorders of lipid metabolism selected from the group of lipidemia or atherosclerosis in a host which comprises administering to said host an effective amount of a pharmaceutical composition having a pharmaceutically acceptable carrier and an effective amount of a compound of the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 and R_2 are each hydrogen, halogen, $-NO_2$, $-NH_2$, $-CF_3$, alkyl having from 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms;

n+m+1 is from 3 to 11,

R_5 and R_6 are each hydrogen, alkyl having 1 to 6 carbon atoms or aralkyl having from 7 to 9 carbon atoms, and

R_4 is hydroxy or $-OR_7$ in which R_7 is alkyl from 1 to 6 carbon atoms.

4,613,619
ANTI-ARRHYTHMIC AMINO-ALCOHOLS

Thomas Sleigh, Wishaw; David S. Savage, Glasgow, and John K. Clark, Hamilton, all of Scotland, assignors to AKZO N.V., Arnhem, Netherlands

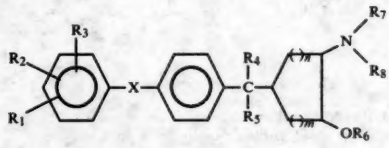
Filed Feb. 22, 1985, Ser. No. 704,491

Claims priority, application United Kingdom, Feb. 28, 1984, 8405112

Int. Cl.⁴ A61K *31/135, 31/22, 31/235;* **C07C** *91/16, 93/26, 93/24*

U.S. Cl. 514—546 **10 Claims**

1. A compound of the forumula



wherein

R_1, R_2 and R_3 is each independently hydrogen alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, alkanoyloxy of

1–6 carbon atoms, hydroxy, halogen or optionally alkyl-substituted amino;

R_4 is hydrogen, hydroxy or alkyl of 1–6 carbon atoms;

R_5 is hydrogen or alkyl of 1–6 carbon atoms;

R_6 is hydrogen, acyl derived from an aliphatic carboxylic acid with 1–6 carbon atoms or from phenyl aliphatic carboxylic acid with 7–10 carbon atoms, or alkyl of 1–6 carbon atoms;

each of R_7 and R_8 is independently hydrogen or alkyl of 1–6 carbon atoms;

X is a direct bond or an oxygen atom, and

each of n and m is independently 1 or 2, whereby the sum of n and m is 2 or 3

or a pharmaceutically acceptable salt thereof.

4,613,620

NOVEL OXIODINIUM AND THIAIODINIUM COMPOUNDS

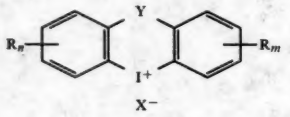
William N. Cannon, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 41,283, May 21, 1979, Pat. No. 4,283,349, which is a division of Ser. No. 337,345, Mar. 2, 1973, Pat. No. 4,193,935, which is a continuation-in-part of Ser. No. 16,589, Mar. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 654,656, Jul. 19, 1967, Pat. No. 3,506,719, which is a continuation-in-part of Ser. No. 270,545, Apr. 4, 1963, abandoned. This application Feb. 13, 1981, Ser. No. 234,238

Int. Cl.[4] A01N *37/00*

U.S. Cl. 514—570 1 Claim

1. A method of inhibiting the growth of micro-organisms which comprises applying to a micro-organism habitat an effective amount of a compound represented by the following formula:



wherein

Y is oxygen or sulfur;

R is lower alkyl, trifluoromethyl or halo;

n and m are numbers of 0 to 3; and

X^- is an anion selected from the group consisting of acetate, propionate, benzoate, benzenesulfonate, fumarate, citrate, lactate, tartrate, and phenylacetate.

4,613,621

FATTY ALDEHYDES AND ACIDS IN THE TREATMENT OF NEUROLOGICAL AND INFLAMMATORY DISEASES

Wilhelm Hörrmann, 8121 Iffeldorf/OBB, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 321,187, Sep. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 127,817, Mar. 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 29,850, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 907,343, May 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 787,902, Apr. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 682,309, May 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,375, Jul. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 450,458, Mar. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 274,754, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 805,934, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 634,884, May 1, 1967, abandoned, which is a continuation-in-part of Ser. No. 412,862, Apr. 20, 1964, abandoned, which is a continuation-in-part of Ser. No. 211,827, Jul. 23, 1972, abandoned, which is a continuation-in-part of Ser. No. 824,798, Jul. 3, 1959, abandoned. This application Mar. 1, 1983, Ser. No. 470,969

Int. Cl.[4] A61K *31/11*

U.S. Cl. 514—693 1 Claim

1. A method of treating tuberculosis in a patient having tuberculosis comprising administering to said patient 100–400 mg/kg daily of at least one of the geometric and optical isomers of

6-n-dodecenoic aldehyde

8-n-hexadecenoic aldehyde and

6,1 2-n-octadecadienoic aldehyde or

8,1 6-n-tetracosadienoic-2-hydroxy aldehyde

per se or as an ether of glycol, glycerol or physiologic acids of bile or in form of plasmalogen, said isomer being diluted in plant oils or in the form of capsule or emulsion.

4,613,622

SEBOSUPPRESSIVE PREPARATIONS CONTAINING BENZYL ALCOHOL DERIVATIVES

Hinrich Moeller, and Siegfried Wallat, both of Monheim, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

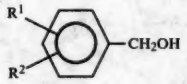
Filed Aug. 30, 1984, Ser. No. 646,173

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332507

Int. Cl.[4] A61K *31/075, 31/045*

U.S. Cl. 514—718 30 Claims

1. A method of treating seborrheic skin or hair comprising the topical application to an individual in need of such treatment of a composition containing a sebosuppressive effective amount of at least one compound of the formula



wherein:

R^1 is a linear or branched C_{4-18}-alkyl, phenyl, or a C_{4-18}-alkyl-oxy-methyl radical, and occupies the 2,3 or 4 positions; and

R^2 is H or forms a fused aromatic ring with R^1.

4,613,623

LOW TEMPERATURE SYNTHESIS OF METHYL FORMATE

Devinder Mahajan, Selden; William A. Slegeir, Hampton Bays; Richard S. Sapienza, Shoreham, and Thomas E. O'Hare, Huntington Station, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 23, 1985, Ser. No. 757,981
Int. Cl.[4] C07C *27/06*
U.S. Cl. 518—700 3 Claims

1. In the simultaneously occuring gas reactions (a) $2CO+2H_2 \rightarrow HCOOCH_3$ and (b) $CO+2H_2 \rightarrow CH_3OH$ catalyzed by a catalyst system composed of a complex reducing agent of the formula XH—ROH—$M(OAc)_2$ wherein X is an alkali metal, M is selected from the group consisting of Ni, Pd or Co and R is a lower alkyl group containing 1-6 carbon atoms and a Group VI metal carbonyl, the improvement which favors driving the reaction to the right in (a) which comprises using said catalyst system as a homogeneous liquid phase catalyst and pressurizing the system which synthesis gas containing about an equimolar amount v/v of CO to the H_2 reactant so that the product ratio of $HCOOCH_3/CH_3OH$ will be up to 1:1.

4,613,624

CONVERSION OF SYNTHESIS GAS TO DIESEL FUEL AND CATALYST THEREFOR

Harold Beuther, Cheswick; Charles L. Kibby, Gibsonia; Thedeus P. Kobylinski, Prospect, and Richard B. Pannell, Allison Park, all of Pa., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 310,969, Oct. 13, 1981, abandoned. This application Apr. 26, 1985, Ser. No. 755,657
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—715 32 Claims

1. A process for the conversion of synthesis gas consisting essentially of CO and hydrogen to a product high in straight chain paraffins in the diesel fuel boiling range, which comprises contacting said synthesis gas under conversion conditions with a catalyst consisting essentially of cobalt on a high surface area, high purity, low acidity alumina support of gamma-alumina, eta-alumina or mixtures thereof, said catalyst having a hydrogen chemisorption value of from about 100 to about 300 micromol of hydrogen per gram of total catalyst when measured at 25° C., said catalyst having been prepared by (A) impregnation of said alumina support with a non-aqueous, organic solvent impregnation solution of cobalt nitrate containing sufficient amounts of a Group IIIB or IVB metal salt to provide said catalyst with from about 0.05 to about 100 parts by weight of a Group IIIB or IVB metal oxide per 100 parts by weight cobalt, (B) reduction of said impregnated alumina support by heating, in the presence of hydrogen, at a heating rate of from about 0.5° to about 5° C. per minute to a maximum temperature in the range of 180° to about 220° C. for a hold time of 6 to about 24 hours and thereafter heating said impregnated alumina support in the presence of hydrogen while heating up to a maximum hold temperature of from about 250° to about 400° C. for a hold time of 6 to about 65 hours.

4,613,625

SUBSTITUTED ALIPHATIC POLYAMIDE POROUS MEMBRANES

Douglas L. Ford, Eastwood, Australia, assignor to Memtec Limited, New South Wales, Australia

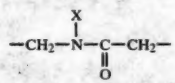
PCT No. PCT/AU84/00210, § 371 Date Jun. 13, 1985, § 102(e) Date Jun. 13, 1985, PCT Pub. No. WO85/01735, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 18, 1984, Ser. No. 758,228
Claims priority, application Australia, Oct. 18, 1983, PG1902
Int. Cl.[4] C08V *9/36*
U.S. Cl. 521—53 9 Claims

1. A method of preparing a porous membrane comprising the steps of:

(i) dissolving an aliphatic thermoplastic polyamide which has both relatively non-crystalline and relatively crystalline portions into an acidic solvent under conditions of temperature and time which cause the relatively non-crystalline portions of the polyamide to dissolve while at least a part of the relatively crystalline portions of the polyamide do not dissolve, but, form a colloidal dispersion in said solvent,

(ii) forming said colloidal dispersion and solvent into a film and thereafter causing precipitation of at least part of the dissolved non-crystalline portions in the film to form a porous membrane matrix, and,

(iii) reacting the membranes matrix with an acid halide of basicity above one to provide within the membrane the following types of structures:



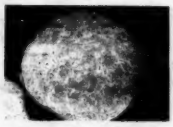
where X is the acid radical of the acid halide of basicity above one.

4,613,626

VINYLIDENE CHLORIDE TYPE RESIN EXPANDABLE PARTICLES, FOAM PARTICLES, IN-MOLD FOAM MOLDING BY USE THEREOF AND PROCESS FOR PRODUCING THEM

Norihiko Sakata, and Nobuo Miura, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 678,416, Dec. 5, 1984, Pat. No. 4,550,003. This application Jun. 20, 1985, Ser. No. 747,036
Claims priority, application Japan, Dec. 13, 1983, 58-233602; Dec. 14, 1983, 58-235594
Int. Cl.[4] C08V *9/18;* B29H *7/20*
U.S. Cl. 521—60 6 Claims



1. Expandable vinylidene chloride type resin particles, comprising substantially non-crystalline vinylidene chloride type resin particles with an average particle size within the range of from 0.05 to 5 mm, which are smooth on the particle surfaces without interstice and which are impregnated with a volatile organic blowing agent wherein said volatile organic blowing agent is a single substance or a mixture of two or more compounds selected from aliphatic hydrocarbons having boiling

points not higher than 60° and aliphatic halogenated hydrocarbons having boiling points not higher than 60° and its molar average solubility parameter (SP value) is within the range of from 5.5 to 9.7.

4,613,627

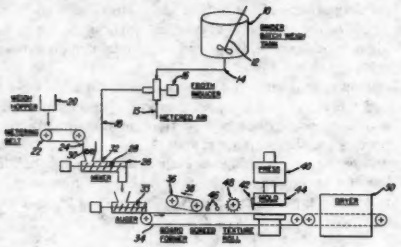
PROCESS FOR THE MANUFACTURE OF SHAPED FIBROUS PRODUCTS AND THE RESULTANT PRODUCT

Norman Sherman, Ramsey, and Timara Underbakke, Roseville, both of Minn., assignors to USG Acoustical Products Company, Chicago, Ill.

Continuation-in-part of Ser. No. 449,263, Dec. 13, 1982, abandoned. This application Oct. 17, 1983, Ser. No. 542,472

Int. Cl.⁴ B32B *5/02;* **C08J** *9/30*

U.S. Cl. 521—68 **89 Claims**



1. A method of manufacturing a shaped fibrous product from an aqueous composition comprising the following ingredients by weight of solids content:

fibers: 25–95%
binder: 5–75%
clay: 0–40%
gypsum: 0–15%
foaming agent: 0.1–5%

said method comprising the successive steps of:

(a) preparing an aqueous admixture by admixing the binder and the foaming agent with water, the water being present in the amount of from about 25% to about 70% by weight of the furnish composition;

(b) combining said aqueous admixture under agitation with air to form an aqueous foamed binder system, the amount of surfactant in combination with the degree of agitation being sufficient so that said air is present in the amount of from about 30% to about 90% by volume of the aqueous foamed binder system;

(c) combining said fibers with said aqueous foamed binder system to form a foamed furnish composition, said foamed composition being a slurry of said fibrous materials in said aqueous foamed binder system;

(d) forming a shaped product from said foamed furnish composition; and

(e) setting the shaped product.

74. A method of manufacturing an acoustical ceiling board from an aqueous furnish composition comprising the following ingredients by weight of solids content:

mineral fibers: 25–70%
cement binder: 30–75%
surfactant: 0.1–1.5%

said method comprising the successive steps of:

(a) preparing an aqueous admixture by admixing the binder and the foaming agent with water, the water being present in the amount of from about 30% to about 50% by weight of the furnish composition;

(b) combining said aqueous admixture under agitation with air to form an aqueous foamed binder system, the amount of srufactant in combination with the degree of agitation being sufficient so that said air is present in the amount of from about 60% to about 75% by volume of the aqueous foamed binder system;

(c) combining said mineral fibers with said aqueous foamed binder system to form a foamed furnish composition, said foamed composition being a slurry of said fibrous material in said aqueous foamed binder system.

4,613,628

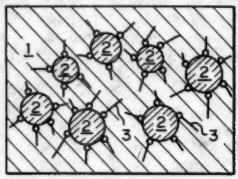
RESIN COMPOSITION FOR CLOSED-CELL FOAM AND CURED RESIN FOAM PREPARED BY USING SAID RESIN COMPOSITION

Yutaka Hoshino, Kawanishi; Koji Kataoka, and Yasumasa Asanaka, both of Takarazuka, all of Japan, assignors to Ferro Enamels (Japan) Limited, Osaka, Japan

Filed Nov. 5, 1984, Ser. No. 668,216

Int. Cl.⁴ C08J *9/08*

U.S. Cl. 521—72 **30 Claims**



1. A composition for formation of a cured resin foam, which comprises (A) a curable resin composition comprising an unsaturated polyester prepolymer and an ethylenically unsaturated monomer, (B) an inorganic powder composed of a carbonate and/or bicarbonate, (C) an aqueous solution of a water-soluble inorganic compound containing a neutralizable acid radical and being capable of forming a colloidal oxide or hydroxide and being gelled by neutralization or an acidic aqueous sol of an inorganic oxide or hydroxide containing a neutralizable acid radical and being capable of being gelled by neutralization, and (D) a substantially water-insoluble surface active agent having a W/O type emulsion-forming capacity, wherein an emulsion structure having a continuous phase of the component (A) and a dispersed particle phase of the component (C) is formed.

4,613,629

METHOD OF FORMING A FOAMED THERMOPLASTIC POLYMER

David V. Duchane, and David L. Cash, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 21, 1984, Ser. No. 673,968

Int. Cl.⁴ C08J *9/12, 9/14*

U.S. Cl. 521—82 **9 Claims**

1. A method of making a foamed polymer comprising the steps of:

a. immersing a solid polymer in an immersant solution consisting essentially of (1) a compatible (with said polymer) carrier solvent, and (2) an infusant solution of an anti-emulsion agent and an incompatible (with said polymer) liquid blowing agent, chosen from the group consisting of isopropyl alcohol and water, in said compatible carrier solvent; for a time sufficient for said immersant solution to infuse into said polymer;

b. selectively extracting said carrier solvent from said polymer so as to leave behind said infusant solution with said blowing agent entrapped in said polymer; and

c. subsequently heating said polymer to a temperature sufficiently high to volatilize said blowing agent entrapped in said polymeric material and thereby expand said polymer into a foamed state.

4,613,630
WATER-BLOWN SILICONE FOAM

Therese M. Bauman, Midland, and John E. Dietlein, Bay City, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 787,854, Oct. 16, 1985. This application Mar. 3, 1986, Ser. No. 835,144

Int. Cl.[4] C08J *9/14, 9/30*

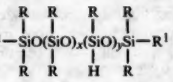
U.S. Cl. 521—134 **3 Claims**

1. An open-cell silicone foam produced at room temperature by a method consisting of

(A) mixing ingredients consisting essentially of

(1) 100 parts by weight of a polydiorganosiloxane having organic groups selected from the group consisting of methyl, ethyl, propyl, vinyl, phenyl, and 3, 3, 3-trifluoropropyl, endblocking consisting of hydroxyl or vinly groups, and a viscosity of from 0.4 to 100 Pa·s at 25° C.,

(2) from 15 to 50 parts by weight of a silicon hydride of the formula



where R is an alkyl radical of 1 to 4 carbon atoms or phenyl and R^1 is R or hydrogen, x and y are such that x is from 0 to 40 percent of y, y is at least 3, and x plus y are such that the viscosity of the silicon hydride is below 0.05 Pa·s at 25° C.,

(3) from 0.5 to 15 parts by weight of water,

(4) from 10 to 100 parts by weight of platinum per million parts of (A) in the form of a platinum catalyst,

(5) optionally a profoamer consisting essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{\frac{1}{2}}$ units and fluorine-containing units selected from the group consisting of $R_aR'_bSiO_{(4-a-b)/2}$ and $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R' is an alkyl radical containing from 1 to 3 carbon atoms, and R'' is a divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by means of a carbon or oxygen atom, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less with the provision that when R and R'' represent fluorine-containing units bonded to silicon via an oxygen atom the organosiloxane copolymer optionally contains repeating units of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxyl group per molecule and selected from the group consisting of polyethers, polyoxylalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than hydroxyl and $SiO_{4/2}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorine-containing units and any $GSiO_{3/2}$ units is sufficient to

(a) impart a surface tension of less than 2.2×10^{31} [4] newtons per centimeter at 25° C. to a 10 percent by weight solution of (5) in a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of 0.08 Pa·s at 25° C., and

(b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity, and

(6) optionally an alcohol having from 1 to 12 carbon atoms, and

(B) allowing the mixture to form a froth and cure at ambient temperature to an elastomeric silicone foam.

4,613,631
CROSSLINKED POLYMERS FOR ENHANCED OIL RECOVERY

Wilton F. Espenscheid, deceased, late of DeSoto (by Loretta Espenscheid, executor), and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 24, 1985, Ser. No. 737,380

Int. Cl.[4] E21B *33/138, 43/22*; C09K *7/00*

U.S. Cl. 523—130 **25 Claims**

1. A method for crosslinking a gel-forming, water soluble polymer which comprises crosslinking the polymer with an organic compound bearing at least two positively charged nitrogen atoms in positions where they are available for forming coordinate crosslinkages with the available crosslinking sites on the polymer.

4,613,632
ETHYLENE COPOLYMERS FOR HOT MELT SYSTEMS

Giorgio Aliani, Waterloo; Jacques B. Lechat, Wezembeek-Oppem, and Jozef A. F. Smits, Berchem, all of Belgium, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

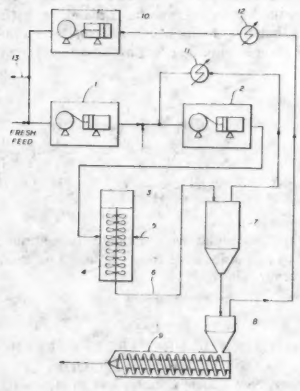
Division of Ser. No. 429,481, Sep. 30, 1982, Pat. No. 4,497,941. This application Feb. 1, 1985, Ser. No. 697,305

Claims priority, application United Kingdom, Oct. 16, 1981, 8131337

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] F21D *7/22*; C08F *218/02*

U.S. Cl. 523—172 **3 Claims**



1. A hot melt roadmarking composition comprising:

(a) from 1 to 30% by weight of an ethylene-vinyl acetate copolymer having from 10 to 22% by weight of vinyl acetate and a melt index of from 2000 to 7500;

(b) from 0 to 29% by weight of a binder resin; and

(c) from 0 to 5% by weight of a plasticizer.

4,613,633
COPOLYMER LATEX

Masayoshi Sekiya, Tokyo, and Koichi Harada, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,639
Int. Cl.[4] C08F *276/06*
U.S. Cl. 523—201 **10 Claims**

1. A copolymer latex for paper coating comprising heterogeneous polymer particles having a hard polymer domain and a soft polymer domain, characterized in that

(a) the hard polymer domain is a polymer having a glass transition temperature of at least 60° C.,

(b) the soft polymer domain is a copolymer obtained by polymerizing in the presence of a latex of the hard polymer a monomeric composition composed of

(i) 20 to 70% by weight of an aliphatic conjugated diene monomer,

(ii) 20 to 60% by weight of a monovinylidene aromatic monomer,

(iii) 0.5 to 10% by weight of an ethylenically unsaturated acid,

(iv) 0 to 10% by weight of an ethylenically unsaturated amide, and

(v) 0 to 30% by weight of a monomer copolymerizable with said monomers,

(c) the proportion of the hard polymer domain is 55 to 90% by weight of the entire polymer particles, and

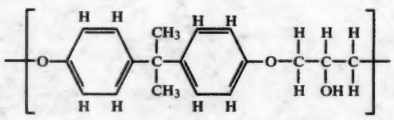
(d) the proportion of the soft polymer domain is 45 to 10% by weight of the entire polymer particles.

4,613,634
LOW WARP FILLED POLYOXYMETHYLENE COMPOSITIONS

Derrick B. McKie, Brooklyn, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,922
Int. Cl.[4] C08K *3/40*
U.S. Cl. 523—223 **10 Claims**

1. A low warp, filled oxymethylene polymer composition comprising a normally solid oxymethylene polymer having an inherent viscosity of at least 1.0 (measured at 60° C. in a 0.1 weight percent solution in p-chlorophenol containing 2 weight percent of alpha-pinene), a molecular weight of at least 10,000 and a melting point of at least 150° C., in an amount of from about 40 to about 99 wt.% of the total composition, glass beads in an amount of from about 1 to about 60 wt.% of the total composition, having an average bead diameter distribution of from greater than 0 up to about 300 microns, and a thermoplastic phenoxy resin having a repeating structure:



and an average molecular weight range from about 15,000 to about 75,000, in an amount of from about 0.1 to about 5 wt.% of the total composition.

4,613,635
COMPOSITION FOR PREPARING PAPERBOARD CONTAINER FOR LIQUIDS

Peter G. Bither, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 8, 1985, Ser. No. 720,646
Int. Cl.[4] C08L *77/06, 61/22*
U.S. Cl. 524—14 **8 Claims**

1. A composition consisting essentially of

(1) wood pulp,

(2) from about 1% to about 10%, based on the weight of the wood pulp on a dry basis, of a polyolefin pulp containing carboxylic functionality, and

(3) from about 0.05% to about 0.6%, based on the weight of the wood pulp on a dry basis, of a cationic water-soluble wet-strength resin.

4,613,636
PEROXIDE-CURABLE BROMINATED FLUOROELASTOMER COMPOSITION CONTAINING AN N,N,N',N'-TETRASUBSTITUTED 1,8-DIAMINONAPHTHALENE

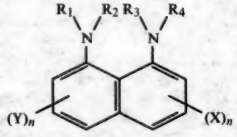
Leo Ojakaar, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 12, 1985, Ser. No. 754,499
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.[4] C08K *5/18;* C08F *8/32*
U.S. Cl. 524—83 **13 Claims**

1. A peroxide-curable fluoroelastomer composition which comprises

(a) a fluoroelastomer whose interpolymerized units consist essentially of units of tetrafluoroethylene, units of perfluoroalkyl perfluorovinyl ether, units of a bromine-containing olefin and, optionally, units of ethylene, and

(b) from about 0.05–2 parts per 100 parts fluoroelastomer of an N,N,N',N'-tetrasubstituted 1,8-diaminonaphthalene having the formula:



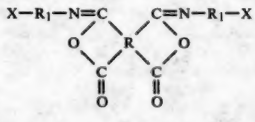
wherein R_1, R_2, R_3 and R_4 are independently alkyl groups of 1–6 carbon atoms, phenyl or benzyl, R_1 and R_2 and/or R_3 and R_4 can be joined to form a 5- or 6-membered heterocyclic ring in which a carbon atom can be replaced by an oxygen or a sulfur atom, R_1 and R_3 and/or R_2 and R_4 can be joined to form a heterocyclic ring of 6–20 carbon atoms in which a carbon atom can be replaced by an oxygen or a sulfur atom, X and Y are independently an alkyl group or an alkoxy group containing 1–4 carbon atoms and n is 0–3.

4,613,637
COPOLYMERS UTILIZING ISOIMIDES AND METHOD OF PREPARING SAME

Abraham L. Landis, Northridge, and Arthur B. Naselow, Marina del Rey, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 27, 1983, Ser. No. 566,089
Int. Cl.[4] C08G *73/10, 73/12*
U.S. Cl. 524—105 **39 Claims**

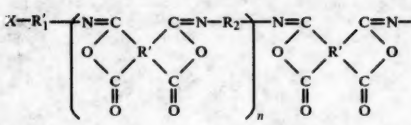
1. A copolymer prepared by copolymerizing an isoimide oligomer having a structure selected from the group consisting of:



(a)

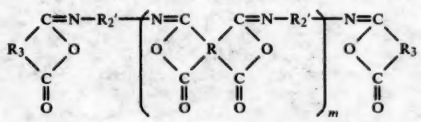
where R is a tetravalent aryl group containing 2 to 27 carbon atoms, R_1 is a divalent organic group containing 1 to 20 carbon atoms, and X is selected from the group consisting of —C≡CH, —CH=CH_2, and —CN;

(b)



where R' is a tetravalent aryl group containing 6 to 18 carbon atoms, R_1' is a C_6 to a C_{20} arylene group, R_2 is a divalent organic group containing 2 to 30 carbon atoms, X is as defined above, and n denotes the degree of polymerization and is 0 or 1 to about 30; and

(c)



where R is a tetravalent aryl group containing 2 to 27 carbon atoms, R_2' is a divalent aryl group containing 6 to 30 carbon atoms, R_3 is a radical containing an alkenylene group, or a trivalent aryl group or heterocyclic group having substituted thereon X as defined above, and m denotes the degree of polymerization and is 1 to about 30 with another compound selected from the group consisting of an ethynyl-terminated sulfone, an acetylene-terminated sulfone, an ethynyl-terminated aryl compound, and an acetylene-terminated aryl compound, said isoimide oligomer being initially soluble in and unreactive with said compound below a predetermined temperature at which said isoimide oligomer and said compound chemically react so that said isoimide oligomer and said compound remain as an unreacted liquid blend below said predetermined temperature, and wherein said isoimide oligomer and said compound react to form said copolymer upon heating said liquid blend to a temperature above said predetermined temperature.

4,613,638

HINDERED PHENOLIC COMPOUNDS DERIVED FROM HEXIDES AND STABILIZED COMPOSITIONS

John F. Stephen, West Chester, Pa.; Jerry H. Smith, and Makram H. Meshreki, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Aug. 19, 1985, Ser. No. 766,500

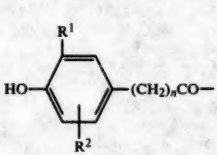
Int. Cl.[4] C07D *493/14;* C08K *5/15*

U.S. Cl. 524—109 **7 Claims**

1. A hindered phenolic compound derived from a hexide having the general formula:

$C_6H_8O_4R_2$

wherein R has the following general formula:



wherein R^1 and R^2 are independently hydrogen or alkyl groups of from 1–8 carbon atoms or cycloalkyl groups having from 5–12 carbon atoms, n has a value of 1–6 and $C_6H_8O_4$ is a hexide structure.

5. An organic material normally subject to thermal and oxidative deterioration containing from 0.005-5% by weight of a compound of claim 1.

6. A composition of claim 5 comprising a resin selected from the group consisting polyethylene, polypropylene and polystyrene.

4,613,639

PREPARATION OF PLASTISOLS AND ORGANOSOLS HAVING A LONG SHELF LIFE

Rainer Blum, Ludwigshafen, and Rolf Osterloh, Gruenstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 587,044, Mar. 7, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 790,800

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308925

Int. Cl.[4] C08K *5/17, 5/12;* C08L *33/02, 33/04*

U.S. Cl. 524—251 **6 Claims**

1. A process for the preparation of a plastisol having a shelf life of more than three days at room temperature which comprises: mixing (1) a finely divided synthetic resin which contains acidic groups and has an acid number of not less than 5 and is selected from the group comprising a copolymer of acrylate or methacrylate compounds and a vinyl ester copolymer and has a particle size of from 0.05 to 500 μm and (2) a plasticizer, to form a dispersion, and adding to said dispersion a dispersion stabilizer, said dispersion stabilizer being an inert or reactive basic protective colloid or basic emulsifier or a mixture thereof, said basic protective colloid being at least one substance selected from the group consisting of polyamide-amine, polyamino-imidazoline, polyetherurethane-amine and polyethyleneimine, which displays a phase-separating surfactant activity between the continuous and the discontinuous phase of a dispersion and said basic emulsifier being a compound which occupies the surface of the disperse phases, said compound being stearylamine, whereby the shelf life of the dispersion at room temperature is increased to more than three days.

4,613,640

TRANSPARENT THERMOPLASTIC ELASTOMERIC COMPOSITIONS AND ARTICLES PRODUCED THEREFROM

Richard J. Deisler, Palm Harbor, and Eugene P. Goldberg, Tampa, both of Fla., assignors to Medical Research Associates, Ltd. #2, Clearwater, Fla.

Filed Nov. 13, 1985, Ser. No. 797,651

Int. Cl.[4] C08K *5/24*

U.S. Cl. 524—264 **14 Claims**

1. A thermoplastic composition which exhibits improved optical clarity comprising a substantially uniform mixture of

(A) an elastomeric thermoplastic hydrocarbon block copolymer in an amount of at least about 30% of the total weight of the composition;

(B) mineral oil in an amount of from about 5 to about 60% by weight of the composition; and

(C) a polysiloxane which is miscible with mineral oil and which has a viscosity within the range of from about 20 to about 1,000,000 centistokes at room temperature in an amount of from about 0.1 to 12%, by weight, of the composition.

4,613,641
COATING AND MOLDING COMPOSITIONS WITH SPREADABILITY IMPROVING AND LUBRICITY INCREASING SILOXANES AND USE OF SUCH SILOXANES AS COATING AND MOLDING COMPOSITION ADDITIVES

Karlheinz Haubennestel, Wesel, and Alfred Bubat, Wesel-Bislich, both of Fed. Rep. of Germany, assignors to BYK-Chemie GmbH, Wesel, Fed. Rep. of Germany

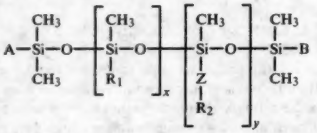
Filed Jul. 24, 1985, Ser. No. 758,354

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427208

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—267 **18 Claims**

1. A composition of matter selected from the group consisting of coating compositions and molding compositions further comprising an effective spreadability enhancing and lubricity improving amount of a polyester group containing siloxane corresponding to the formula



I

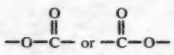
wherein:

R_1 represensts an alkyl group having 1 to 30 carbon atoms and up to 20 weight percent of the alkyl groups may be replaced by phenyl groups substituted by from 0 to 3 methyl groups or by phenylalkylene groups in which the phenyl group may be substituted by 0 to 3 methyl groups and the alkylene group contains 2 to 3 carbon atoms;

A represents methyl or R_2—Z—,

B represents methyl or R_2—Z—,

R_2 represents an aliphatic, cycloaliphatic or aromatic polyester group free of Zerewittinoff hydrogen atoms and containing at least three



groups, said polyester group having an average molecular weight from about 200 to about 3000,

Z represents a divalent group that connects a silicon atom to an R_2 group,

x represents a number from 3 to 250, and

y represents a number from 0 to 50; the molecules of said siloxane contain on the average at least one R_2—Z— group, and the ratio of the number of R_2—Z— groups to x is from 1:2 to 1:40.

4,613,642
THERMALLY STABLE PHENOLIC COMPOUNDS

Lester P. J. Burton, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 24, 1984, Ser. No. 685,987

Int. Cl.[4] C07C *39/15;* **C08K** *5/13*

U.S. Cl. 524—349 **4 Claims**

1. Polyolefin normally susceptible to gradual degradation in the presence of oxygen containing about 0.005 to about 10 weight percent 1,3,5-trimethyl-2,4,6-tris(3,5-dibenzyl-4hydroxybenzyl)benzene.

4. An antioxidant compound of high thermal stability, namely 1,3,5-tris(3,5-dibenzyl-4-hydroxybenzyl)-2,4,6-trimethylbenzene.

4,613,643
POROUS SHEET

Shunichi Nakamura; Kenji Okamura, both of Tokuyama; Shingo Kaneko, Houfu, and Kiyoshi Sumi, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Feb. 9, 1984, Ser. No. 578,763

Int. Cl.[4] C08K *3/00*

U.S. Cl. 524—426 **8 Claims**

1. A porous sheet comprising (i) 40 to 80% by weight of an inorganic filler and (ii) 60 to 20% by weight of a polyolefin type thermoplastic elastomer composition comprising at least 50% by weight of a polyolefin type thermoplastic elastomer selected from the group consisting of an ethylene-propylene copolymer, an ethylene-propylene-diene copolymer and an ethylene-butene-1 copolymer, in which the tensile stress at a temperature of 25° C. under 100% stretching (100% modulus) is 10 to 100 kg/cm^2, the elongation at break under stretching is at least 100% and the permanent strain under 100% stretching is less than 50% and up to 50% by weight of a thermoplastic polyolefin resin plastomer, said sheet being stretched in at least one direction and having fine communicating pores in the interior thereof, wherein the initial tensile elastic modulus is lower than 500 kg/cm^2, the permanent strain after 50% stretching is lower than 50%, the air permeability is lower than 10000 sec/100 cc, the water pressure resistance is at least 1000 mmH_2O, the maximum pore size is smaller than 10 microns and the elongation at break is at least 50%.

4,613,644
RESINOUS COMPOSITION

Tohei Moritani, and Kyoichiro Ikari, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 6, 1985, Ser. No. 708,794

Claims priority, application Japan, Mar. 23, 1984, 59-57087; May 10, 1984, 59-93934

Int. Cl.[4] C08K *3/18, 3/22*

U.S. Cl. 524—430 **16 Claims**

13. A resinous composition according to claim **1** in which the elements in Groups I, II and III of the periodic table are selected from the group consisting of sodium, potassium, magnesium, calcium, barium, zinc and aluminum.

4,613,645
SILICON CARBIDE REINFORCEMENT OF POLY(ARYL ETHER KETONES)

Lloyd M. Robeson, Whitehouse Station; James E. Harris, Piscataway, and Michael J. Michno, Jr., Bridgewater, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 12, 1985, Ser. No. 764,549

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—443 **9 Claims**

1. A thermoplastic, injection moldable composite comprising at least one poly(aryl ether ketone) having silicon carbide whiskers dispersed therein.

4,613,646
CLEANING AND POLISHING COMPOSITIONS

Paul E. Sandvick, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 15, 1985, Ser. No. 723,021

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—476 **18 Claims**

1. A surface-treating, water-in-oil emulsion composition for furniture and similar household items comprising water, organic solvent, film-former, nonionic emulsifier and an alpha-olefin/maleic anhydride polymer selected from the group consisting of: (a) polymers of (a1) maleic anhydride and (a2) at least one 1-alkene having 12–30 carbon atoms; and (b) polymers of (b1) maleic anhydride, (b2) at least one lower 1-alkene and (b3) at least one higher 1-alkene, said lower 1-alkenes

having 4–18 carbon atoms and said higher 1-alkenes having more than 18 carbon atoms.

3. A surface-treating, water-in-oil emulsion composition for furniture and similar household items comprising:

from about 0.05 to about 5 percent by weight of an alpha-olefin/maleic anhydride polymer selected from the group consisting of: (a) polymers of (a1) maleic anhydride and (a2) at least one 1-alkene having 12–30 carbon atoms; and (b) polymers of (b1) maleic anhydride, (b2) at least one lower 1-alkene and (b3) at least one higher 1-alkene, said lower 1-alkenes having 4–18 carbon atoms and said higher 1-alkenes having more than 18 carbon atoms;

from about 0.2 to about 5 percent by weight of a nonionic emulsifier;

from about 5 to about 70 percent by weight of a hydrocarbon solvent;

from about 0.5 to about 15 percent by weight of a film-forming silicone compound;

from about 0.05 to about 5 percent by weight of a coupling oil; and

from about 60 to 85 percent by weight water.

9. A surface-treating, water-in-oil emulsion composition for furniture and similar household items comprising:

from about 0.1 to about 8 percent by weight of an alpha-olefin/maleic anhydride polymer selected from the group consisting of: (a) polymers of (a1) maleic anhydride and (a2) at least one 1-alkene having 12–30 carbon atoms; and (b) polymers of (b1) maleic anhydride, (b2) at least one lower 1-alkene and (b3) at least one higher 1-alkene, said lower 1-alkenes having 4–18 carbon atoms and said higher 1-alkenes having more than 18 carbon atoms;

from about 0.2 to about 5 percent by weight of a nonionic emulsifier;

from about 5 to about 70 percent by weight of a hydrocarbon solvent;

from about 1 to about 30 percent by weight of a film-forming non-drying oil;

from about 0.05 to about 5 percent by weight of a coupling oil; and

from about 40 to 85 percent by weight water.

4,613,647

POLYPROPYLENE COMPOSITIONS CONTAINING POLYAMIDES REINFORCED BY GLASS FIBERS

Rikio Yonaiyama, Ichiharashi; Michio Kasai, Kisarazushi, and Nobukazu Atsumi, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 25, 1985, Ser. No. 715,266

Claims priority, application Japan, Mar. 28, 1984, 59-60379

Int. Cl.[4] C08L *23/26, 77/10;* **C08K** *3/40, 7/28*

U.S. Cl. 524—514 **9 Claims**

1. Polypropylene compositions reinforced by glass fibers, obtained by melting and kneading a mixture of (A) 60~95 parts by weight of a polypropylene resin modified by an unsaturated carboxylic acid or an anhydride thereof or polypropylene resin containig 5 parts by weight or more of polypropylene resin modified by an unsaturated carboxylic acid or an anhydride thereof

(B) 50~5 parts by weight of a polyamide resin obtained by the polycondensation of metaxylene diamine and adipic acid and

(C) 5~100 parts by weight of glass fibers per 100 parts by weight of the total amount of the above-mentioned (A) and (B) constituents.

4,613,648

CASTABLE CERAMIC COMPOSITIONS

Hugo R. Usala, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 594,701, Mar. 29, 1984, Pat. No. 4,536,535, which is a continuation-in-part of Ser. No. 501,978, Jun. 7, 1983, abandoned. This application May 24, 1985, Ser. No. 737,549

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] C08L *39/00*

U.S. Cl. 524—555 **8 Claims**

1. An organic medium for the dispersion of inorganic solids consisting essentially of

a. a mixture of compatible polymers of 0–100% wt. C_{1-8} alkyl methacrylate, 100–0% wt. C_{1-8} alkyl acrylate and 0–5% ethylenically unsaturated carboxylic acid or ethylenically unsaturated amine dissolved in

b. a nonaqueous organic solvent, the polymers being further characterized as having a number average molecular weight (M_n) of 50,000 to 100,000, a weight average molecular weight (M_w) of 150,000 to 350,000, the ratio of M_w to M_n being no greater than 5.5, the total amount of unsaturated carboxylic acid or unsaturated amine in the polymer mixture is 0.2–2.0% wt. and the glass transition temperature of the polymer and plasticizer therein, if any, is −30° to +45° C.

4,613,649

PROCESS FOR PRODUCING PLASTIC CONCRETE

Takashi Saeki, and Hideaki Matsuda, both of Kagawa, Japan, assignors to Okura Kogyo Kabushiki Kaisha, Japan

Filed Jul. 15, 1985, Ser. No. 755,194

Claims priority, application Japan, Jul. 14, 1984, 59-145267; Jan. 9, 1985, 60-856

Int. Cl.[4] C04B *25/04, 13/24*

U.S. Cl. 524—650 **15 Claims**

1. A process for producihg a plastic concrete which comprises mixing a nonionic surface active agent having a hydrophilic-lipophilic balance of 3 to 6, a vinyl monomer, and a cement slurry with stirring to form a W/O type emulsion, thereafter polymerizing the vinyl monomer and hardening the cement in said W/O type emulsion simutaneously.

4,613,650

COPOLYMER LATEX

Masayoshi Sekiya, Tokyo; Toshiro Ishizuka, Yokosuka; Daiharu Maeda, Yokohama; Kenzo Miyamoto, Yokohama, and Takahiro Shimazoe, Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,500

Int. Cl.[4] C08L *9/04*

U.S. Cl. 524—828 **16 Claims**

1. A process for producing a copolymer latex which comprises emulsion polymerizing 20 to 50% by weight of a conjugated diolefin, 15 to 50% by weight of an aromatic vinyl compound, 0 to 25% by weight of a vinyl cyanide, 5 to 40% by weight of an alkyl ester of an unsaturated carboxylic acid, and 0.5 to 10% by weight of an ethylenically unsaturated acid; wherein

(a) first, a monomeric mixture composed of the entire aromatic vinyl compound, the entire vinyl cyanide, at least a part of the conjugated diolefin, at least a part of the ethylenically unsaturated acid, and 0–100% of the alkyl ester of an unsaturated carboxylic acid, the amount of the monomeric mixture being 55 to 95% by weight based on the weight of all the monomers, is polymerized in emulsion, and

(b) then, the remainder of the monomers which amounts to 5 to 45% by weight of the weight of all the monomers is added to the above polymerization system and the mixture is polymerized in emulsion.

4,613,651

FIRE RETARDANT THERMOPLASTIC POLYESTER AND POLYESTERETHER COMPOSITIONS

Ronald I. Markezich, Williamsville, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 633,563, Jul. 23, 1984. This application Jun. 3, 1985, Ser. No. 740,600

Int. Cl.[4] C08L *67/02*

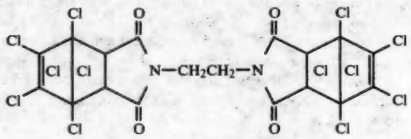
U.S. Cl. 525—42 4 Claims

1. An elastomeric flame retardant thermoplastic polyesterether composition comprising

(a) from about 50% to about 90% by weight of a polyesterether elastomer prepared from dimethyl terephthalate, polyether glycol and 1,4-butanediol,

(b) from about 0 to about 40% by weight of antimony trioxide, and

(c) at least about 5% by weight of a chlorinated bisimide of the formula:



4,613,652

CURABLE RESIN COMPOSITIONS

Takeo Nakayama, Ibaraki; Kimiya Fujinami, Takarazuka; Takurou Sakamoto, Kawanishi, and Fumihiro Doura, Sakai, all of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

Filed Jun. 7, 1985, Ser. No. 742,529

Claims priority, application Japan, Jun. 18, 1984, 59-125688

Int. Cl.[4] C08F *259/04, 259/08*

U.S. Cl. 525—276 9 Claims

1. A curable resin composition which comprises (1) a copolymer composed of (a) at least one member selected from the group consisting of an aminoalkyl acrylate and an aminoalkyl methacrylate and (b) at least one member selected from the group consisting of an, acrylate, a alkyl methacrylate, a vinyl ester of fatty acid, an aliphatic monoolefin, an aromatic monoolefin, acrylonitrile, vinyl chloride and vinyl fluoride being mixed with (2) a compound having at least two acryloyl groups in the molecule.

4,613,653

MODIFICATION OF POLYMERS

John D. Kitchens, and Leo R. Novak, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 619,515, Jun. 11, 1984, abandoned. This application Mar. 20, 1985, Ser. No. 713,921

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—352 28 Claims

1. A modified polymer comprising the reaction product of (a) a precursor polymer substantially devoid of ethylenic unsaturation, and (b) a thiocyano or isothiocyano free radical or ion generating reactant prepared by contacting a and b under free radical or ion generating reaction conditions characterized in that the modified polymer is a solid having a surface portion and an interior portion such that the surface portion comprises the reaction product of the thiocyano or isothiocyano free radical or ion generating reactant and the precursor polymer and the interior portion is substantially devoid of such reaction product.

4,613,654

POLYARYLENESULFIDE COMPLEXES, PROCESSES FOR PRODUCTION AND USES THEREOF

Takayuki Katto; Toshitaka Kouyama; Takao Iwasaki, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,321

Claims priority, application Japan, May 15, 1984, 59-95705

Int. Cl.[4] C08F *283/00*

U.S. Cl. 525—537 4 Claims

1. A process for producing a polyarylenesulfide complex having the properties as defined in (A) through (C) below, which comprises reacting a polyarylenesulfide with 0.05 to 20 miles of at least one strongly basic metal compound selected from the group consisting of a hydroxide of an alkaline earth metal, an oxide of an alkaline earth metal and a hydrocarbyloxide of an alkali metal per 100 mols of arylenesulfide groups contained in the polyarylenesulfide said reaction being conducted with the polyarylenesulfide in the molten state at a temperature from its melting point to 400° C. and in the substantial absence of a liquid dispersant:

(A) $\eta^*/\eta_o^* = 3$ to 100, wherein the η^* and η_o^* stand for melt viscosities of the complex and the starting polyarylenesulfide, respectively;

(B) $\Delta T_{c2} = (T_{c2})_0 - T_{c2} = 10°$ to 100° C., wherein T_{c2} and $(T_{c2})_0$ stand for crystallization temperatures of the complex and the starting polyarylenesulfide, respectively, observed when the polyarylenesulfide is cooled from its molten state; and

(C) $\Delta(\Delta E) - \Delta E - (\Delta E)_0 = 5$ to 75 kcal/mol, wherein ΔE and $(\Delta E)_0$ stand for apparent flow activation energies of the complex and the starting polyarylenesulfide, respectively.

4,613,655

CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Paolo Longi; Umberto Giannini, both of Milan; Romano Mazzocchi, Pernate, and Domenico Deluca, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 811,974, Jun. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 579,861, Apr. 17, 1975, abandoned, which is a continuation of Ser. No. 412,507, Nov. 2, 1973, abandoned, which is a continuation of Ser. No. 164,008, Jul. 19, 1971, abandoned. This application Jan. 15, 1981, Ser. No. 225,366

Claims priority, application Italy, Jul. 20, 1970, 27627 A/70

Int. Cl.[4] C08F *4/02, 10/02*

U.S. Cl. 526—114 22 Claims

1. A component of catalysts for the polymerization of olefins and which is the product obtained by contacting (1) a titanium compound with a support consisting of a mixture of (2) an anhydrous Mg dihalide and (3) an anhydrous compound of a metal belonging to one of Groups I and II of said Periodic Table, the anhydrous Mg dihalide (2) being in an active state such that it has a surface area exceeding 3 m^2/g, or in its X-rays spectrum the diffraction line which is most intense in the X-rays powder spectrum of the normal, non-active Mg dihalide is less intense, the anhydrous compound of the Group I or Group II metal (3) being different from an anhydrous Mg dihalide, non-reactive with the anhydrous Mg dihalide under the conditions of preparing the catalyst, selected from the group consisting of lithium chloride, sodium chloride, sodium bromide, beryllium chloride, calcium chloride, strontium chloride, cadmium bromide, cuprous chloride, mercury(ic) chloride, sodium sulphate, sodium carbonate, zinc oxide, beryllium oxide, borax, calcium sulphate, calcium carbonate, beryllium sulphate, calcium stearate and sodium vinylsulphonate, and present in the mixture of (2) and (3) in an amount of from 30% to 70%.

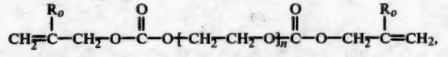
4,613,656

METHOD FOR POLYMERIZING BIS(ALLYL CARBONATE) RESIN

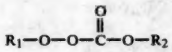
Robert H. Tang, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 23, 1984, Ser. No. 674,115
Int. Cl.[4] C08F 110/00
U.S. Cl. 526—193 7 Claims

1. In the method of polymerizing polyol(allyl carbonate) monomer represented by the graphic formula,



wherein R_o is hydrogen, halogen or C_1–C_4 alkyl, and n is a whole number from 1 to 3, wherein the monomer is mixed with peroxide initiator and the resultant mixture exposed to a thermal zone to polymerize the monomer, the improvement which comprises polymerizing a mixture of said monomer and an adhesion reducing amount of monomer-compatible mold release agent with, as the sole initiator, from about 0.75 to about 1.50 parts, per hundred parts of monomer, of monoperoxycarbonate represented by the graphic formula,



wherein R_1 is a tertiary C_4–C_5 alkyl and R_2 is a C_3–C_7 alkyl, thereby to form a fully cured, intact solid article having a fifteen second Barcol hardness of at least 20, the mold release agent being such as to not adversely affect the physical properties of the solid article.

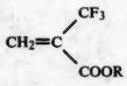
4,613,657

METHOD FOR ANIONIC HOMOPOLYMERIZATION OF α-TRIFLUOROMETHYLACRYLATE

Tadashi Narita, Yokohama; Tokio Hagiwara, Tokyo, and Hiroshi Hamana, Fukaya, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 6, 1986, Ser. No. 826,585
Claims priority, application Japan, Feb. 20, 1985, 60-30623
Int. Cl.[4] C08F 4/08, 14/18
U.S. Cl. 526—204 10 Claims

1. A method of preparing a homopolymer of an α-trifluoromethylacrylate represented by the general formula (1). comprising the step of keeping the monomer of said α-trifluoromethylacrylate dissolved in an organic solvent in the presence of an anionic polymerization catalyst which is an alkoxide represented by the general formula (2):



(1)

wherein R represents an alkyl group or a fluorine-containing alkyl group:

4,613,658

(2)

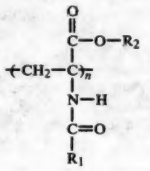
wherein R′ represents an alkyl group and M represents an alkali metal.

VINYL MONOMERS CAPABLE OF FORMING SIDE-CHAIN LIQUID CRYSTALLINE POLYMERS AND THE RESULTING POLYMERS

Lon J. Mathias, and Robert E. Hermes, both of Hattiesburg, Miss., assignors to University of Southern Mississippi, Hattiesburg, Miss.

Filed Oct. 15, 1985, Ser. No. 787,051
Int. Cl.[4] C08F 26/00, 126/00, 226/00, 4/46
U.S. Cl. 526—312 13 Claims

1. A polymer containing repeating units of the formula



wherein R_1 is selected from the group of long chain alkyl, aryl, substituted long chain alkyl, and substituted aryl, and R_2, is selected from the group consisting of a hydrogen atom, alkyl, or aryl.

4,613,659

LOW TEMPERATURE POLYMETHYLSILOXANE CONTAINING SILICON-BONDED HYDROGEN AND CURABLE COMPOSITIONS MADE THEREWITH

Chi-long Lee, and Myron T. Maxson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 16, 1985, Ser. No. 809,455
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—15 15 Claims

1. A polymethylsiloxane containing silicon-bonded hydrogen consisting of 84 to 96 mole percent dimethylsiloxane units, 2 to 10 mole percent methylsilsesquioxane units, 0.5 to 6 mole percent trimethylsiloxy units, and 0.25 to 3 mole percent monohydrogendimethylsiloxy units, where the total mole percent of trimethylsiloxy units and monohydrogendimethylsiloxy units is at least 1.5.

4,613,660
POLYOL/POLYEPOXIDE/POLYURETHANE ADHESIVE

Anil B. Goel, Worthington; Harvey J. Richards, and Robert A. Grimm, both of Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 19, 1985, Ser. No. 702,706
Int. Cl.[4] C08G *18/48, 18/24, 18/58;* C09J *3/14*
U.S. Cl. 528—73 7 Claims

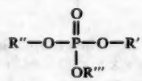
1. An adhesive composition comprising a mixture of a polyether polyol, a polyepoxide, a polyisocyanate and a polyurethane catalyst selected from the group consisting of an organo tin compound and a mixture of an organo tin compound and an organo iron compound, wherein in equivalent functionality ratio of hydroxyl to epoxy groups in the polyol and the polyepoxide is within the range of from 98/2 to 50/50 and the equivalent ratio of isocyanate to combined hydroxyl and epoxy equivalent is in the range of from about 0.8 to 2.0.

4,613,661
EPOXY PHOSPHATE COMPOSITIONS

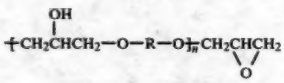
Horst G. Langer, Wayland; Thomas P. Brady, Holliston; Marsha A. Paul, Natick, and George A. Doorakian, Bedford, all of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1985, Ser. No. 738,325
Int. Cl.[4] C08G *59/30*
U.S. Cl. 528—108 21 Claims

1. A process for preparing a phosphate ester which contains at least one terminal epoxide moiety, the process comprising contacting under reaction conditions, optionally in the presence of water, at least one phosphoric acid ester with an amount of an epoxide having an epoxy equivalent greater than one, said amount being sufficient to substantially neutralize the phosphoric acid functionality of the phosphoric acid ester, the contacting being such that there is formed a composition comprising a phosphate ester containing terminal epoxide functionality and corresponding to the formula:



wherein R′ is a glycidyl ether of the general formula:



wherein

R is a difunctional remnant of a dihydroxy compound formed by removal of the hydroxyl groups thereof;

R″ is a group as defined by R‴ or R′;

R‴ is an organic group of up to about 20 carbons; and

n is a positive number less than about 20 and is equal to the number of repeating units in the compound.

4,613,662
PROCESS FOR CATALYTIC PREPARATION OF POLY(ETHER-AMIDE) POLYMERIC COMPOSITION FROM OXAZOLINE AND POLYPHENOL

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 7, 1985, Ser. No. 763,166
Int. Cl.[4] C08G *69/00, 14/04*
U.S. Cl. 528—137 6 Claims

1. A process comprising copolymerizing an oxazoline with a bis- or poly-phenolic compound in the presence of a catalyst which conforms to the formula $M(X)_n$ wherein M represents an alkali or alkaline earth metal moiety, X represents BF_3, BF_4, BPH_4 or ClO_4, and n represents 1 or 2 at a temperature in the range of from about 100° to 200° C.

4,613,663
THERMOPLASTIC AND THERMOSETTABLE PRODUCTS PREPARED BY REACTING NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS WITH AROMATIC ALDEHYDES

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1985, Ser. No. 777,659
Int. Cl.[4] C08G *12/04*
U.S. Cl. 528—266 26 Claims

1. A thermoplastic or thermosettable product which results from reacting a composition comprising

(A) at least one aromatic heterocyclic material containing at least one nitrogen atom and at least two reactive substituent groups having a reactive hydrogen atom attached to a carbon atom which is attached to the aromatic heterocyclic ring;

(B) at least one aldehyde having a hydrogen atom attached to a carbon atom which is adjacent to a carbonyl group; and

(C) optionally at least one material selected from

(1) hydroxy aromatic aldehydes;

(2) aromatic dialdehydes; and

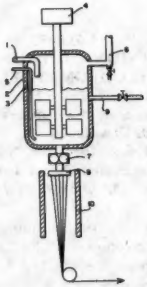
(3) combinations of (1) and (2); and

wherein, when component (C) is absent, components (A) and (B) are present in quantities which provide a molar ratio of component (B) to component (A) of from about 0.5:1 to about 10:1 and when component (C) is present, the components are present in a molar ratio of components (B) to (C) to (A) of from about 0.25:0:1 to about 10:2:1.

4,613,664
PROCESS FOR PRODUCTION OF POLYESTER

Susumu Tate, Shiga; Hiroshi Hashimoto, Otsu, and Akira Chiba, Kobe, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

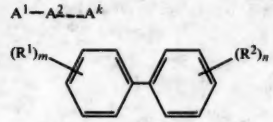
Filed Dec. 26, 1985, Ser. No. 813,460
Claims priority, application Japan, Dec. 28, 1984, 59-279547; Jun. 20, 1985, 60-135349; Jun. 27, 1985, 60-141247
Int. Cl.[4] C08G *63/04, 63/22*
U.S. Cl. 528—274 5 Claims



1. A process for production of polyester which comprises steps of:

subjecting aromatic dicarboxylic acid or alkyl ester thereof, and glycol to ester exchange reaction or esterification, and

subjecting the resulting mixture to polycondensation in one or more of heating mediums selected from the group consisting of compounds having the following general formula (I) or (II) to give a polyester having an intrinsic viscosity of not less than 0.9:



(I)

(II)

(wherein A^l and A^k are phenyl or C_{5-20} cycloalkyl; A^2 to A^{k-1} are, respectively, phenylene or C_{5-20} cycloalkylene; R^1 and R^2 are C_{1-20} alkyl; k is integer of 2–5; and m and n are integer of 0–5, provided that $n+m \cong 1$).

4,613,665

PROCESS FOR COVALENT COUPLING FOR THE PRODUCTION OF CONJUGATES, AND POLYSACCHARIDE CONTAINING PRODUCTS THEREBY OBTAINED

Olle Larm, Nyängsvägen 86, S-161 39 Bromma, Sweden

Filed Feb. 8, 1983, Ser. No. 464,996

Claims priority, application Sweden, Feb. 9, 1982, 8200751

Int. Cl.[4] C08B *37/08, 37/10*

U.S. Cl. 536—20 **9 Claims**

5. A conjugate comprising a 1-deoxy-2,5-anhydrohexitol unit which constitutes the terminal unit in a substance selected from the group consisting of heparin, deacetylated dermatan sulfate, chitosan, and deacetylated hyaluronic acid, which substance is covalently bound in the 1-position to an amino group associated with a substrate, wherein said substrate is selected from the group consisting of polyvinyl chloride, polyethylene, sepharose and antithrombin.

4,613,666

NEPLANOCIN A DERIVATIVES

Kiyofumi Fukukawa, Sapporo; Takao Hirano; Masatoshi Tsujino, both of Shizuoka; Tooru Ueda, Sapporo; Tadashiro Fujii, and Satoshi Yaginuma, both of Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 330,696, Dec. 14, 1981, abandoned. This application Sep. 16, 1985, Ser. No. 776,093

Claims priority, application Japan, Dec. 12, 1980, 55-176401; Dec. 19, 1980, 55-178825; Nov. 18, 1981, 56-185100

Int. Cl.[4] C07D *473/32*

U.S. Cl. 544—277 **4 Claims**

1. 2',3',5'-O-triacetyl neplanocin A.

3. N^6, N^6,5'-O-tribenzoyl neplanocin A.

4,613,667

SILANE DIIMIDIC TETRACARBOXYLIC PERYLENE DYES

Antonio Marraccini, Dormelletto; Filippo M. Carlini, Novara; Giorgio Bottaccio, Novara; Antonio Pasquale, Novara, and Giorgio Maranzana, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 22, 1984, Ser. No. 663,166

Claims priority, application Italy, Oct. 28, 1983, 23501 A/83

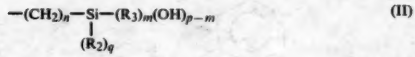
Int. Cl.[4] C07D *471/04*; C07F *7/04, 7/10*

U.S. Cl. 546—14 **6 Claims**

1. A heterocyclic compound containing at least one silane group and having the formula:

(I)

in which R is a silane group of formula:



(II)

wherein n is 3, 4 or 5; q is 0 or 1; p and m are integers, such that when q is 0, p is 3 and m is 0, 1, 2 or 3, and when q is 1, p is 2 and m is 0, 1 or 2; R_2 is an alkyl having up to 4 carbon atoms or a phenyl; R_3 is an alkoxyl having up to 2 carbon atoms; R_1 may be the same as R or may be an alkyl having up to 6 carbon atoms, a cycloalkyl, a phenyl optionally substituted by one or more halogens or alkyl or alkoxyl groups containing up to 6 carbon atoms.

4,613,668

SHORT TOTAL SYNTHESIS OR MORPHINAN COMPOUNDS WHICH USES CYCLIZATION OF A CYCLOALKYLCARBONYL COMPOUND SELECTED FROM CYCLOPROPYLCARBONYL AND CYCLOBUTYLCARBONYL

Kenner C. Rice, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

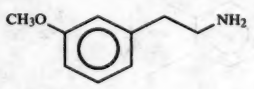
Filed Dec. 22, 1983, Ser. No. 564,515

Int. Cl.[4] C07D *489/02*

U.S. Cl. 546—44 **1 Claim**

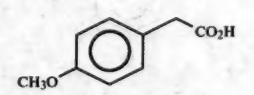
1. An improved total synthesis for the production of morphinan compounds which comprises

heating a mixture of an amine compound of formula 3



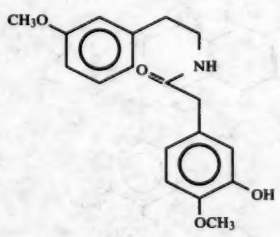
3

and pure acid compound 4



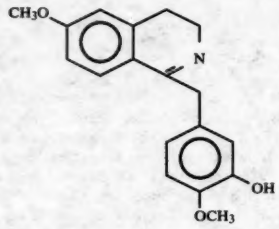
4

at 200° C. for about two hours under argon or other inert gas to obtain an amide, compound 5



5

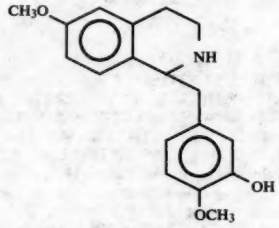
contacting compound 5 with phosphorus oxychloride to produce the 1,2-dehydro derivative, compound



6

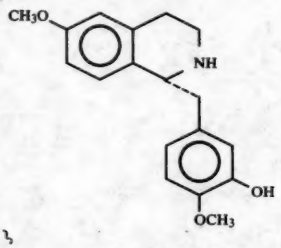
which need not be isolated;

neutralizing a solution of the crude 1,2-dehydro derivative 6 with aqueous ammonia and reducing with sodium borohydride or sodium cyanoborohydride to give tetrahydroisoquinoline, compound 7



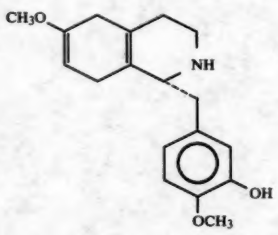
7

optical resolution of tetrahydroisoquinoline, 7, with tartaric acids or nitrotartranilic acids gives compound (+)-7, or alternately asymmetric reduction of 6 with chiral hydride reagents gives compound (+)-7



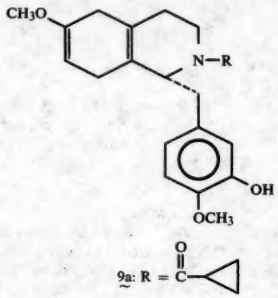
(+)-7

treating compound (+)-7 in liquid NH_3 or lower alkyl amine with lithium and a mixture of tetrahydrofuran and t-butanol containing potassium tertiary butoxide to give the Birch base compound (+)-8



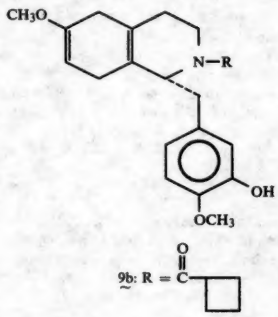
(+)-8

treating compound (+)-8 with cyclopropylcarbonyl chloride in a two-phase mixture of aqueous carbonate and hydrocarbon or halogenated hydrocarbon to give compound 9a, where R=cyclopropylcarbonyl



9a: R = C(=O)-cyclopropyl

analogously treating compound (+)-8 with cyclobutylcarbonyl chloride in the same two-phase systems to give the corresponding compound 9b



9b: R = C(=O)-cyclobutyl

treating 9a and 9b separately with ethylene glycol and an acid catalyst in tetrahydrofuran to give compounds 10a and 10b, respectively, which need not be isolated.

4,613,669

PREPARATION OF 1,4-DIKETOPYRROLO-[3,4-C]PYRROLES

Luigi Cassar, Bologna, Italy; Abul Iqbal, Ettingen, and Alain C. Rochat, Fribourg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

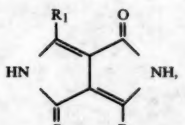
Filed Jul. 8, 1983, Ser. No. 512,074

Claims priority, application Switzerland, Jul. 8, 1982, 4171/82

Int. Cl.[4] C07D *487/04, 403/14, 407/14, 409/14*

U.S. Cl. 546—167 **8 Claims**

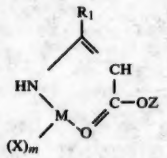
1. A process for the preparation of a 1,4-diketopyrrolo-[3,4-c]pyrrole of the formula



(I)

wherein each of R_1 and R_2 independently of the other is phenyl of said phenyl substituted by one or two fluorine, chlorine or bromine atoms or mixtures thereof, by one, two or three methoxy or methyl groups or mixtures thereof with chlorine

atoms, by cyano, by dimethylamino, by trifluoromethyl, by alkoxycarbonyl of 2 to 3 carbon atoms, by tert-butyl, by cyanophenyl, by acetyl or by alkylbenzoyloxy of 11–14 carbon atoms; biphenylyl; naphthyl or said naphthyl substituted by methoxy; anthryl; phenanthryl; pyridyl or said pyridyl substituted by methyl or by amyloxy; quinolyl; furyl or thienyl, which consists essentially of reacting 1 mole of the compound of the formula



(II)

wherein M is a metal atom, Z is alkyl or aryl, X is halogen or acetate, and m is a value from 0 to 2, with 1 mole of a compound of the formula

$$YCH_2COOZ \quad \text{(III)}$$

wherein Y is halogen, and with 1 mole of a nitrile of the formula

$$R_1—CN \quad \text{(IV)}$$

or

$$R_2—CN \quad \text{(V)}$$

in an organic solvent and at elevated temperature of 60°–160° C., and isolating the compound of formula I.

4,613,670

GROUP IVB METAL CONTAINING POLYDYES

Jack A. Schroeder; Charles E. Carraher, Jr., both of Fairborn, Ohio, and Richard A. Schwarz, Big Spring, Tex., assignors to Wright State University, Dayton, Ohio

Continuation of Ser. No. 377,641, May 13, 1982, abandoned, which is a continuation of Ser. No. 136,573, Apr. 1, 1980, abandoned. This application May 3, 1984, Ser. No. 606,856

Int. Cl.[4] C09B *11/08*

U.S. Cl. 549—211 **9 Claims**

1. A polymeric dye composition having the structure $(D\text{-}Cp_2M)_n$, wherein D is the Lewis base of a water soluble salt of a fluorescein dyestuff selected from the group consisting of fluorescein, tetrabromofluorescein, tetraiodofluorescein, tetrachlorotetraiodofluorescein, and tetrabromotetrachlorofluorescein; wherein Cp_2M is a metallocene moiety in which M is a Group IVB metal, Cp is a cyclopentadienyl moiety and n is an integer greater than 1; said polymeric dye having a limiting viscosity number of from 3 to 238 ml/gm.

2. The composition of claim 1 wherein M is titanium.

4,613,671

PROCESS FOR THE PREPARATION OF MELDRUM'S ACID

Attila G. Relenyi; David E. Wallick, both of Midland, Mich., and Jill D. Streit, Columbus, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1985, Ser. No. 749,145

Int. Cl.[4] C07D *319/06*

U.S. Cl. 549—274 **15 Claims**

1. A process for preparing Meldrum's acid which comprises the steps of:

(a) mixing acetone, malonic acid, and an acid catalyst in molar ratios from about 1.0:1.0:0.005 to about 2.3:1.0:0.12, respectively, to form a mixture comprising: a solution phase of the acetone, acid catalyst, and from about 5 to about 25 mole percent of the malonic acid; and a solid phase of from about 75 to about 95 mole percent of the malonic acid,

(b) adding acetic anhydride to the mixture obtained from step (a), the total amount of acetic anhydride which is added is from about 0 percent molar excess to about 150 percent molar excess relative to the total malonic acid molar concentration, said addition of acetic anhydride occurring at a rate such that at any given time during the addition of acetic anhydride the concentration of unreacted acetic anhydride in the mixture does not exceed about 14 mole percent relative to the malonic acid molar concentration concurrently present in the solution phase.

4,613,672

PROCESS FOR THE PRODUCTION OF TEA CATECHINS

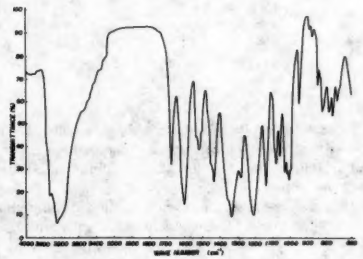
Yukihiko Hara, Shizuoka, Japan, assignor to Mitsu Norin Co., Ltd., Tokyo, Japan

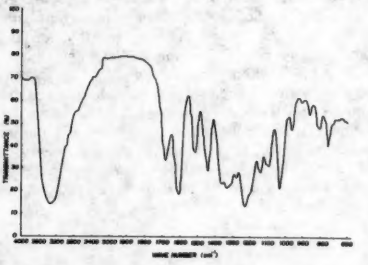
Filed Jun. 27, 1984, Ser. No. 624,943

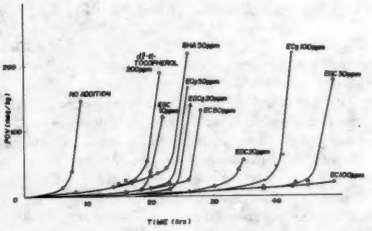
Claims priority, application Japan, Jul. 5, 1983, 58-120963

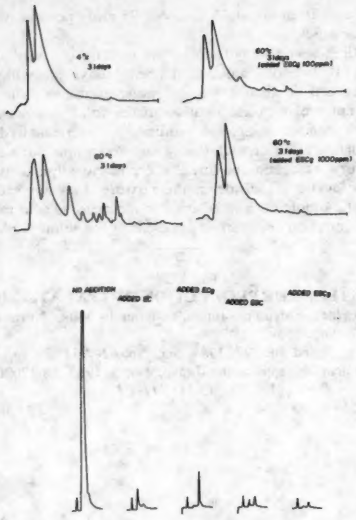
Int. Cl.[4] C07D *311/04*

U.S. Cl. 549—399 **18 Claims**









1. A process for producing tea catechins selected from the group consisting of (−) epicatechin, (−) epigallocatechin, (−) epicatechin gallate, and (−) epigallocatechin gallate, which comprises the steps of

extracting tea leaves selected from the group consisting of unfermented tea and half-fermented tea with hot water or a solvent selected from a group consisting of a 40–75% aqueous solution of methanol, a 40–75% aqueous solution of ethanol and a 30–80% aqueous solution of acetone to obtain an extract-containing solution;

washing the extract-containing solution with chloroform;

contacting the washed solution with an organic solvent selected from the group consisting of ethyl acetate, n-butanol, methyl isobutyl ketone, and acetone to transfer the extract into said organic solvent;

distilling away the organic solvent to yield a concentrated solution containing the extract; and

passing the extract through a reversed phase column in the presence of an eluting solution consisting essentially of 0–25 volume % of acetone, 0–35 volume % of tetrahydrofuran and 65–85 volume % of water to thereby obtain said tea catechins.

4,613,673

CATALYSTS PREPARATION THEREOF AND PREPARATION OF N-SUBSTITUTED ACRYLAMIDES THEREWITH

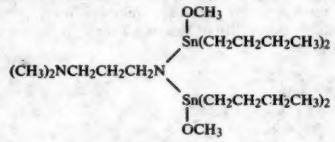
Edward E. McEntire, and Kathy B. Sellstrom, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,017
Int. Cl.[4] C07F 7/22
U.S. Cl. 556—100 **4 Claims**

1. A method for preparing a catalyst composition useful for catalyzing the reaction of a primary or secondary amine with an acrylate or methacrylate to form the corresponding acrylamide or methacrylamide which comprises the steps of:

(a) preparing a reaction mixture of at least an equimolar amount of 3-dimethylaminopropylamine and a tin compound selected from the group consisting of stannous methoxide and dibutyltin dimethoxide, reacting said compounds at a temperature of about 20° to about 150° C. for a period of time within the range of about 1 to about 5 hours and recovering the liquid addition product of said amine and said tin compound from the products of said reaction.

4. A compound having the formula:



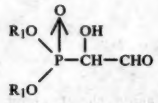
4,613,674

2-HYDROXY-2-PHOSPHINYL ETHANALS AND 1,2-DIHYDROXY-1,2-BISPHOSPHINYL ETHANES

Alexandros K. Tsolis, 171 Old National Road, Arachovitika, and Ioannis A. Mikroyannidis, Navmahias Elis 48-52, Patra, both of Greece

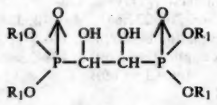
Division of Ser. No. 288,607, Jul. 30, 1981, Pat. No. 4,431,596. This application Sep. 23, 1983, Ser. No. 522,866
Int. Cl.[4] C07F 9/38, 9/40
U.S. Cl. 558—161 **9 Claims**

1. A compound of the formula:



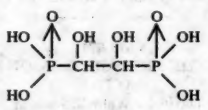
wherein R_1 is selected from the group consisting of methyl, propyl, butyl, cyclohexyl, phenyl, benzyl, propyl substituted by chlorine, propyl substituted by bromine, and hydrogen, and in which the R_1 groups may be the same or different.

4. A compound of the formula:



wherein R_1 is selected from the group consisting of methyl, propyl, butyl, cyclohexyl, phenyl, benzyl, propyl substituted by chlorine, or propyl substituted by bromine, or in which one of the R_1 groups on each phosphinyl moiety is hydrogen, and in which the several R_1 groups may be the same or different.

9. 1,2-dihydroxy-1,2-bis(dihydroxyphosphinyl)ethane, having the formula:



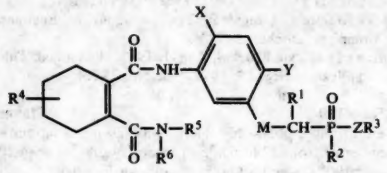
4,613,675

PHOSPHORUS CONTAINING 1-CYCLOHEXENE-1,2-DICARBOXAMIDES

Shy-Fuh Lee, Sunnyvale, Calif., assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 30, 1984, Ser. No. 677,113
Int. Cl.[4] C07F 9/32; A01N 57/02
U.S. Cl. 558—170 **13 Claims**

1. A compound of the following formula (A):



(A)

wherein,

M is oxygen, sulfur, sulfinyl, sulfonyl or N—R;

each of X and Y is independently hydrogen or halogen;

Z is oxygen;

each of R and R^1 is independently hydrogen or lower alkyl;

R^2 is lower alkyl;

R^3 is lower alkyl, alkoxyalkyl or alkoxycarbonylalkyl;

R^4 is hydrogen;

R^5 is lower alkyl, cycloalkyl or alkoxyalkyl; and

R^6 is hydrogen or lower alkyl.

4,613,676

SUBSTITUTED 5-AMINO-4-HYDROXYVALERYL DERIVATIVES

Walter Fuhrer, Frenkendorf; Peter Bühlmayer, Arlesheim; Vittorio Rasetti, Basel, and Bernhard Riniker, Frenkendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

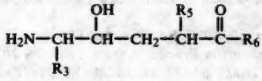
Filed Nov. 14, 1984, Ser. No. 671,261

Claims priority, application Switzerland, Nov. 23, 1983, 6285/83

Int. Cl.[4] C07C *101/30, 69/74, 101/72, 61/08*

U.S. Cl. 560—39 **3 Claims**

1. A process for the preparation of a compound of the formula



(VIII)

wherein

R_3 is hydrogen, lower alkyl, cycloalkyl, aryl-lower alkyl, or aryl;

R_5 is lower alkyl, cycloalkyl, aryl-lower alkyl, or aryl; and

R_6 is

(A) amino;

(B) mono or di-substituted amino or substituted hydroxy, which substituents are selected from

(i) unsubstituted and substituted, saturated and unsaturated, aliphatic hydrocarbon radicals having up to and including 18 carbon atoms; and

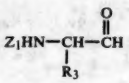
(ii) aromatic, heteroaromatic, aromatic-aliphatic and heteroaromatic-aliphatic radicals having up to and including 18 carbon atoms;

(C) a natural alpha-amino acid residue that is N-terminally bound to the group —CO—, said natural alpha-amino acid being C-terminally free, esterified, or amidated;

(D) a di- or tri-peptide residue consisting of amino acids selected from natural alpha-amino acids and statin, said di- or tri-peptide being N-terminally bound to the group —CO— and, being C-terminally free, esterfied, or amidated;

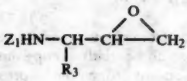
and salts thereof comprising:

(a) converting a compound of the formula



(IX)

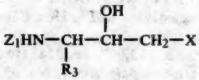
wherein R_3 is as defined above and Z_1 is an amino-protecting group, with a methylide selected from dialkylsulphonium methylide, alkyl or phenyl dialkylamino sulphoxonium methylide, and dialkylsulphoxonium methylide, into an expoxide of the formula



(X)

wherein Z_1 and R_3 are as defined above;

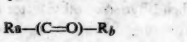
(b) reacting said epoxide of formula (X) with a nucleofugal leaving group X introducing agent to result in the compound of the formula



(XI)

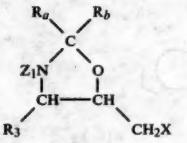
wherein R_3Z_1 and X are as defined above;

(c) reacting a compound of formula (XI) with a carbonyl compound of the formula



(XII)

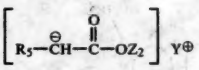
wherein each of R_a and R_b are independently hydrogen, lower alkyl, aryl, or aryl-lower alkyl, or R_a and R_b together are an alkylidene or bridged alkylidene having 4–12 carbon atoms, or a reactive derivative of said carbonyl compound, in the presence of an acidic reagent to result in a compound of the formula



(XIII)

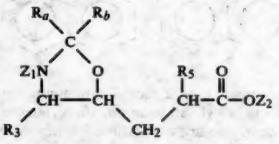
wherein R_a, R_b, R_3, Z_1, and X are as defined above;

(d) reacting said compound of formula (XIII) with a carboxylic acid ester salt of the formula



(XIV)

wherein R_5 is as defined above, Z_2 is a carboxy protecting group and $Y^{\ominus}$ is a cation to yield a compound of the formula



(XV)

wherein R_a, R_b R_3, R_5, Z_1, and Z_2 are as defined above;
(e) removing said carboxy-protecting group Z_2;
(f) opening the ring of formula (XV) with a solvolysis reagent; and then
(g) removing said protecting group Z_1.

4,613,677

ONE-STEP HYDROGENATION/ESTERIFICATION OF BENZYLOXY PHENOXY PROPANOIC ACID

Stanley B. Mirviss, Stamford, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 5, 1985, Ser. No. 804,963
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—61 **13 Claims**

1. A process for preparing (hydroxyphenoxy) carboxylates from arylmethyleneoxyaryloxyalkanoic acids comprising reacting the acid with an alcohol and hydrogen in the presence of an acidic esterification catalyst and an hydrogenation catalyst.

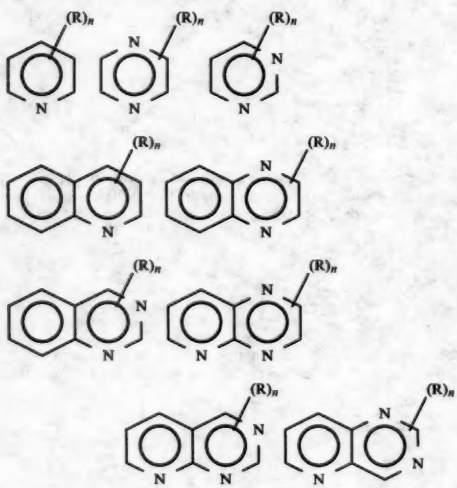
4,613,678

ESTERIFICATION OF AROMATIC DICARBOXYLIC ACIDS WITH CYCLIC ALKYLENE CARBONATES

Daniel J. Swart, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 112,007, Jan. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 35,171, May 2, 1979, abandoned. This application Jun. 30, 1980, Ser. No. 164,745
Int. Cl.[4] C07C *67/03, 69/80, 69/82, 69/88*
U.S. Cl. 560—92 **11 Claims**

1. A process for producing a bis(2-hydroxy-alkyl)ester of an aromatic dicarboxylic acid comprising reacting by contacting an aromatic dicarboxylic acid with a cyclic alkylene carbonate in a molar ratio of dicarboxylic acid to cyclic alkylene carbonate of from about 1:2 to about 1:20 at a temperature from about 145° C. to about 200° C. in the presence of a catalytic amount of an organic compound containing at least one six-membered aromatic nitrogen-containing heterocyclic moiety selected from the group consisting of



wherein R is amino, phenyl, or a radical containing up to 4 carbons selected from alkyl, alkylamino, dialkylamino and oxyalkyl; and n is zero, one or two and recovering the bis(2-hydroxyalkyl)ester produced.

4,613,679

EMULSIFIABLE MODIFIED POLYMERS

Kenneth R. Mainord, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 820,958, Aug. 1, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 75,358
Int. Cl.[4] C07C *69/60*
U.S. Cl. 560—190 **5 Claims**

1. An emulsifiable poly-alpha-olefin wax having a saponification number of from 20 to 60, melt viscosity greater than 20 centipoise at 190° C., and a Gardner color of less than 2, prepared by reacting a low viscosity poly-alpha-olefin selected from the group consisting of crystalline polypropylene and crystalline ethylene/propylene copolymer containing about 1.5 weight percent ethylene having a melt viscosity of 20–500 cp. at 190° C. with lower alkyl diester of maleic acid in the presence of a free radical source.

4,613,680

PREPARATION OF ANGELIC ACID OR ESTERS THEREOF

Masanobu Naruto; Hisao Kondo, both of Kamakura, and Go Hata, Fujisawa, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP82/00248, § 371 Date Feb. 24, 1984, § 102(e) Date Feb. 24, 1984, PCT Pub. No. WO84/00161, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 28, 1982, Ser. No. 589,075
Int. Cl.[4] C07C *67/333, 51/353*
U.S. Cl. 560—205 **11 Claims**

1. Process for preparing angelic acid or esters thereof which comprises isomerizing tiglic acid or an ester thereof in the presence of an organic sulfinic acid to form a thermal equilibrium mixture in which the content of angelic acid or ester is less than the content of tiglic acid or ester, and distilling angelic acid or ester from the mixture.

4,613,681

PROCESS FOR THE MANUFACTURE OF FLUORINATED ALKANOLS AND ESTERS THEREOF

Louis Foulletier, Oullins, and André Lantz, Vernaison, both of France, assignors to Produits Chimiques Ugine Kuhlmann, France

Filed Jun. 30, 1980, Ser. No. 163,978
Claims priority, application France, Aug. 8, 1979, 79 20280
Int. Cl.[4] C07C *69/003, 67/00, 31/38, 29/58, 29/124*
U.S. Cl. 560—236 **7 Claims**

1. A process for the preparation of a fluorinated alkanol, ester, or mixture thereof of the general formula

$$R_FC_2H_4OR$$

comprising reacting an iodide of the general formula $R_FC_2H_4I$ with a percarboxylic acid of the general formula R^1CO_3H at a temperature and for a time sufficient to form said fluorinated compound; in said formulae R_F is a straight or branched chain perfluorinated radical containing 1 to 20 C atoms, R is a hydrogen atom or —COR^1, and R^1 is a hydrogen atom or an aliphatic or aromatic hydrocarbon radical.

4,613,682

ETHER SYNTHESIS

Kathryn A. Eickholt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 19, 1985, Ser. No. 767,222
Int. Cl.[4] C07C *41/16*
U.S. Cl. 560—61 **20 Claims**

1. A process of making aromatic ethers comprising the step of contacting, in the vapor phase, a phenolic compound and an organic halide (which has a haloaliphatic moiety), with a catalytic amount of a solid catalyst containing a metal oxide or a

metal under conditions such that the corresponding ether and hydrogen halide are formed.

4,613,683

PREPARATION OF ALKYL GALLATES

Walter Rebafka, Hirschberg, and Helmüt Nickels, Mutterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

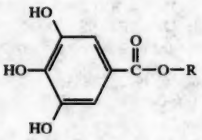
Filed Jan. 25, 1985, Ser. No. 694,937

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403575

Int. Cl.[4] C07C *69/88*

U.S. Cl. 560—67 11 Claims

1. A process for the preparation of an alkyl gallate of the formula



I

where R is C_1–C_{20}-alkyl, which process comprises:

reacting a tannin with an alcohol R-OH, wherein R has the above meaning, and a strong acid in catalytic amounts up to 50% by weight, based on the amount of the tannin employed.

4,613,684

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACID ESTERS

Tetsuo Aoyama; Koichi Kida, and Takako Uchiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

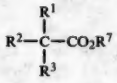
Filed Sep. 27, 1984, Ser. No. 655,331

Claims priority, application Japan, Oct. 6, 1983, 58-187492; Oct. 6, 1983, 58-187493

Int. Cl.[4] C07C *103/127, 69/675*

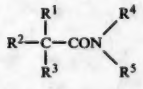
U.S. Cl. 560—179 19 Claims

1. A process for the preparation of a carboxylic acid ester of the formula



and an amide of the formula

which comprises reacting (A) a carboxylic acid amide represented by the formula



with (B) an alcohol of the formula R^7OH and carbon monoxide in the presence of (i) a bicyclic amidine or a tertiary amine catalyst or (ii) a bicyclic amidine or a tertiary amine catalyst together with a metal carbonyl catalyst in which the metal is selected from Groups VIB, VIIB and VIII of Mendelejeff's Periodic Table of Elements, at a temperature of from 50° to 400° C. under a carbon monoxide partial pressure of from 10 to 500 Kg/cm^2, the molar ratio of said alcohol/said carboxylic acid amide being in the range of from 1 to 30, wherein R^1 is selected from the group consisting of a hydrogen atom, a hydroxyl group, alkyl groups with 1 to 5 carbon atoms and alkenyl groups with 1 to 5 carbon atoms; R^2 and R^3 are independently selected from the group consisting of a hydrogen atom, alkyl groups with 1 to 5 carbon atoms and alkenyl groups with 1 to 5 carbon atoms; R^4 and R^5 are independently selected from the group consisting of a hydrogen atom and alkyl groups with 1 to 5 carbon atoms; and R^7 is an alkyl group with 1 to 8 carbon atoms.

4,613,685

ALIPHATIC-CYCLOALIPHATIC DIISOCYANATES

Gerhard Klein, Monheim, and Dieter Arlt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

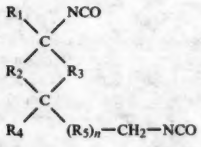
Filed Jan. 14, 1985, Ser. No. 691,103

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402623

Int. Cl.[4] C07C *119/045*

U.S. Cl. 560—330 5 Claims

1. A diisocyanate, optionally in the form of an isomeric mixture, having an isocyanate content of about 30 to 48% and corresponding to formula I



(I)

wherein

R_1 represents an alkyl group having 1 to 4 carbon atoms,

R_2 and R_3, which may be identical or different, represent linear or branched chain, divalent hydrocarbon groups having 1 to 4 carbon atoms,

R_4 represents hydrogen or an alkyl group having 1 to 4 carbon atoms,

R_5 represents a linear or branched chain, saturated, divalent hydrocarbon group having 1 to 4 carbon atoms, and

n represents 0 or 1.

4,613,686

PROCESS FOR THE PREPARATION OF POLYISOCYANATES WITH BIURET STRUCTURE

Klaus König, Leverkusen; Josef Pedain, Cologne, and Helmut Woynar, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,138

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403277

Int. Cl.[4] C07C *127/24*

U.S. Cl. 560—335 8 Claims

1. A process for the preparation of polyisocyanates having a biuret structure by reacting excess quantities of an aliphatic diisocyanate at elevated temperature with a biuretizing agent based on

(a) an α,α,α-trisubstituted acetic acid containing no isocyanate reactive groups apart from the carboxyl group and optionally

(b) water,

wherein the molar ratio of component (a) to component (b) is from 1:0 to 1:2.5.

4,613,687
POLYISOCYANATES OF THE DIPHENYL METHANE SERIES

Hartmut Knöfel, Odenthal, and Michael Brockelt, Berg.-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

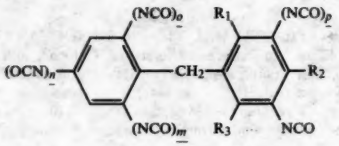
Filed Aug. 17, 1981, Ser. No. 293,748

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032358

Int. Cl.⁴ C07C *119/048*

U.S. Cl. 560—359 **1 Claim**

1. A composition consisting essentially of at least 60 percent of a mixture of polyisocyanates corresponding to the general formula



wherein each of the two aromatic rings contains at least one isocyanate group;

R_1, R_2 and R_3 which may be the same or different, each represent hydrogen, a methyl or an ethyl group, provided that two of the radicals R_1, R_2 and R_3 represent hydrogen; and

m, n, o and p each represent 0 or 1 and that when m and/or n and/or o and/or p represents 0, the free valency is filled by hydrogen and that the sum of m+n+o+p is on a statistical average from 1.2 to 1.7 and up to 40 wt. % (based on the total composition) of other alkyl-substituted polyisocyanato-diphenylmethane isomers.

4,613,688
OPTICAL RESOLUTION PROCESS FOR DL-CYSTEINE

Chozo Inoue, Kanagawa; Yoshiko Kurima, and Soyao Moriguchi, both of Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 364,702

Int. Cl.⁴ C07B *57/00*

U.S. Cl. 562—401 **5 Claims**

1. A process for the optical resolution of DL-cysteine which comprises

(1) converting DL-cysteine into a hydrochloride thereof and forming a saturated or supersaturated aqueous solution thereof,

(2) inoculating said solution with crystals of one optically active form of cysteine hydrochloride as seed crystals, and

(3) preferentially crystallizing optically the same form of the cysteine hydrochloride used as the seed crystals, in a state of a monohydrate thereof.

4,613,689
RACEMIZATION OF OPTICALLY ACTIVE COMPOUNDS HAVING A CHLORINE SUBSTITUTED CHIRAL CARBON ATOM

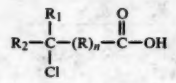
Patricia Siuta-Mangano, Mount Vernon, and Samun K. Dahod, Yorktown Heights, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 30, 1985, Ser. No. 771,091

Int. Cl.⁴ C07B *55/00*

U.S. Cl. 562—401 **14 Claims**

1. A process for racemizing an optically active organic acid of the formula:



wherein R can be aliphatic or aromatic, R_1 and R_2 can each be hydrogen or alkyl of up to 20 carbon atoms wherein R_1 and R_2 are different and n is an integer of zero or 1 comprising heating an acidified solution of said optically active organic acid in the presence of a chloride ion in an amount sufficient and at a pH and temperature sufficient to racemize said acid.

4,613,690
RACEMIZATION OF OPTICALLY ACTIVE COMPOUNDS HAVING A BROMINE SUBSTITUTED CHIRAL CARBON ATOM

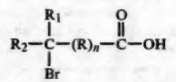
Samun K. Dahod, Yorktown Heights, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 30, 1985, Ser. No. 771,092

Int. Cl.⁴ C07B *55/00*

U.S. Cl. 562—401 **17 Claims**

1. A process for racemizing an optically active organic acid of the formula:



wherein R can be aliphatic or aromatic, R_1 and R_2 can each be hydrogen and alkyl of up to 20 carbon atoms wherein R_1 and R_2 are different and n is an integer of zero or 1 comprising heating an acidified solution of said optically active organic acid in the substantial absence of halide ion other than bromine ion in an amount sufficient and at a pH and temperature sufficient to racemize said optically active organic acid.

4,613,691
PREPARATION OF AMINO ACIDS FROM UNSATURATED HYDANTOINS

Stanley B. Mirviss, Stamford, Conn., and Mark W. Empie, Ashland, Mass., assignors to Stauffer Chemical Company, Westport, Conn.

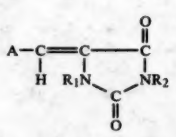
Continuation-in-part of Ser. No. 642,238, Aug. 17, 1984, abandoned. This application Jul. 8, 1985, Ser. No. 751,581

Int. Cl.⁴ C07C *99/08*

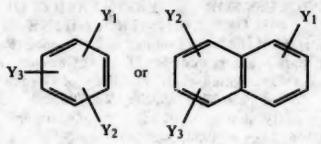
U.S. Cl. 562—443 **43 Claims**

1. A process for preparing racemates of alpha amino acids comprising:

(a) producing an unsaturated hydantoin by condensing a hydantoin with an aldehyde in the presence of at least one basic salt of an inorganic acid, said unsaturated hydantoin having the formula:



wherein A is X or Y and X is unbranched or branched alkyl or alkenyl, cycloalkyl, cycloalkenyl, alkylthio, hydroxyalkyl, aralkyl, mono or dialkylaminoalkyl, acylaminoalkyl, mercaptoalkyl, cycloalkyl having a —CH_2— group replaced by —O—, —S—, or —NH—, cycloalkenyl having a —CH= replaced by —O—, —S—, or —N—; Y is



wherein Y_1, Y_2, and Y_3 are the same or different and are hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, halogen, hydroxy, nitro, cyano, amino, alkylaminoalkyl, dialkylaminoalkyl, alkoxy, alkylthio, acyloxy, mercaptoalkyl, alkaryl, aralkyl, acylaminoalkyl, cycloalkyl having a $—CH_2—$ group replaced by —O—, —S—, or —NHR—, cycloalkenyl having a —CH= replaced by —N— or where two of the members, Y_1, Y_2, and Y_3, are joined together to form an alkylene group having at least one $—CH_2—$ group replaced by —O—, —S—, or —NH= or an alkenylene group having at least one —CH= group replaced by —N=; and R_1 and R_2 are the same or different and are hydrogen, alkyl, aryl, acyl, or amino;

(b) reducing said unsaturated hydantoin with hydrogen using a nickel catalyst in the presence of more than a stoichiometric amount of caustic or using zinc in the presence of hydrochloric acid to produce saturated hydantoins and/or ring opened derivatives thereof; and

(c) hydrolyzing the product of step (b) by heating to a temperature sufficient to hydrolyze the product of step (b) with at least 3 molar equivalents of an alkali metal hydroxide or a mineral acid under from 1 to 5 atmospheres pressure to produce racemates of alpha amino acids.

4,613,692

PROCESS FOR THE PREPARATION OF CINNAMIC ACIDS WHICH ARE OPTIONALLY SUBSTITUTED IN THE NUCLEUS

Bernhard Beitzke, Bergisch Gladbach; Volkmar Handschuh, Burscheid, and Heinz U. Blank, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,254

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422915

Int. Cl.[4] C07C *63/64*

U.S. Cl. 562—495 **14 Claims**

1. A process for the preparation of a cinnamic acid which comprises introducing into a reaction vessel an optionally substituted benzaldehyde and an alkali metal salt of a carboxylic acid and/or alkali metal (bi) carbonate, the resultant mixture containing less than a stoichiometric amount of acetic ahhydride, heating the reaction mixture to a temperature in the range of 100° to 200° C. and thereafter adding sufficient acetic anhydride such that it is present in at least a stoichiometric amount based upon the amount of optionally substituted benzaldehyde, the acetic anhydride being at least partially metered in during the course of reaction of the optionally substituted benzaldehyde with acetic anhydride.

4,613,693

PROCESS FOR THE CO-PRODUCTION OF A C_2 TO C_{10} MONOCARBOXYLIC ACID AND FORMIC ACID

David J. M. Ray, Hull, England, assignor to BP Chemicals Limited, London, England

Filed Mar. 11, 1982, Ser. No. 357,186

Claims priority, application United Kingdom, Mar. 13, 1981, 8107943

Int. Cl.[4] C07C *51/12, 53/04, 53/08*

U.S. Cl. 562—517 **9 Claims**

1. A process for the co-production of a C_2 to C_{10} monocarboxylic acid and formic acid which process comprises reacting so that the conversion of the alkyl formate to carbonylation products is less than 90% at an elevated temperature below 250° C. a C_1 to C_9 alkyl formate with carbon monoxide and water in the presence as catalyst of a Group VIII noble metal component and an iodine or bromine-containing promoter, the molar ratio of water to alkyl formate is in the range of 1:1 to 10:1, the partial pressure of carbon monoxide being in the range 1 to 300 bar, the concentration of noble metal component being in the range from 100 to 5000 ppm and the atomic ratio of noble metal to iodine or bromine being in the range from 1:50 to 1:1000 and thereafter recovering the co-produced C_2 to C_{10} monocarboxylic acid and formic acid.

4,613,694

PREPARATION OF UNSATURATED OR SATURATED α, ω-DIALDEHYDES AND α, ω-DIACIDS

Pier P. Rossi, Garlasco, and Salvatore Marchetti, Cesano Maderno, both of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Sep. 30, 1980, Ser. No. 192,478

Claims priority, application Italy, Oct. 5, 1979, 26292 A/79

Int. Cl.[4] C07C *45/40, 45/59, 51/34*

U.S. Cl. 562—590 **8 Claims**

1. A process for the concurrent preparation of olefinically unsaturated or saturated α,ω-dialdehydes and α,ω-diacids, comprising treating a solution of a monoozonide of a mono- or polyunsaturated cycloolefin and a polar solvent by suspending said monoozonide solution in water and separating the water by decanting; subsequently adding an aqueous alkali solution wherein said alkali is selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides and alkali metal carbonates to the solution of monoozonide, at room pressure and a temperature from −5° C. to 70° C.; maintaining, during said addition of alkali, a pH from about 8 to 12; and isolating the resulting dialdehyde and the diacid.

4,613,695

N-NITROSO COMPOUNDS AND COMPOSITIONS CONTAINING SUCH COMPOUNDS

Jan-Inge L. Carlsson; Herta G. Jensen Petersen, and Anders R. Stamvik, all of Helsingborg, Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

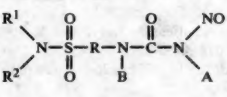
Filed Sep. 6, 1983, Ser. No. 529,718

Claims priority, application Sweden, Sep. 17, 1982, 8205324

Int. Cl.[4] C07C *143/76, 143/74;* A61K *31/445, 31/18*

U.S. Cl. 564—33 **12 Claims**

1. Compound having the formula:



wherein

A is lower alkyl or halolower alkyl;

B is hydrogen, lower alkenyl; lower alkynyl; 3–6 C cycloalkyl;—$R'SO_2NR^3R^4$, or lower alkyl optionally monosubstituted with lower alkoxy or 3–6 C cycloalkyl;

R and R′ are straight or branched 2–5 C alkylene, R being optionally monosubstituted with $SO_2NR^3R^4$ or $CONR^3R^4$, said R and R′ alkylene always containing at least two carbon atoms separating the nitrogen atom of the urea from any $SO_2NR^1R^2$ or $SO_2NR^3R^4$;

R^1 and R^2 are the same or different and selected from hydrogen, 5–6 C cycloalkyl, lower alkoxy, phenyl, benzyl, and straight or branced 1–6 C alkyl, optionally monosubstituted with hydroxy, lower alkoxy, $SO_2NR^3R^4$, or $CONR^3R^4$; R^1 and R^2 may also together form a 4–5 C alkylene;

R^3 and R^4 are the same or different and selected from hydrogen and lower alkyl,

with the proviso that no more than one of R^1, R^2, R, and B

may contain a sulfonamide or carboxamide moiety at the same time.

4,613,696

PROCESS FOR UREA PRODUCTION

Umberto Zardi, Via Lucino 57, Breganzona, Switzerland, assignor to Umberto Zardi and Ammonia Casale S.A., both of, Switzerland

Filed May 2, 1985, Ser. No. 729,528

Claims priority, application Switzerland, May 19, 1984, 2477/84

Int. Cl.[4] C07C *126/02, 126/08*

U.S. Cl. 564—67 **12 Claims**

1. In a process for the production of urea from ammonia and carbon dioxide at an effective pressure and temperature, wherein the urea formation takes place in at least one synthesis zone and in which an excess of free ammonia is present to favor high conversions, thereby producing a urea composition containing an excess of free ammonia, residual carbamate and urea and the residual carbamate is removed by stripping the urea composition with a counter current stream of a major amount of fresh CO_2, the improvement comprising prior to contacting the urea composition with the major amount of fresh CO_2, adiabatically contacting the urea composition with a minor amount of fresh CO_2 to thereby remove an amount of NH_3 from the urea composition which is substantially free of water vapor and directly recycling the NH_3 to the synthesis zone.

4,613,697

PROCESS FOR THE DISPLACEMENT TO THE GASEOUS PHASE OF THE EXCESS OF NH_3 CONTAINED IN AN AQUEOUS UREA SOLUTION

Giorgio Pagani, Milan, Italy, assignor to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 500,992, Jun. 3, 1983, abandoned, and a continuation-in-part of Ser. No. 629,486, Jul. 10, 1984, abandoned. This application Dec. 26, 1984, Ser. No. 686,383

Claims priority, application Italy, Jun. 8, 1982, 21774 A/82; Jul. 14, 1983, 22073 A/83

Int. Cl.[4] C07C *126/02, 126/08*

U.S. Cl. 564—67 **15 Claims**

1. A process for the displacement to the gaseous phase, at 80–250 Kg/cm^2, of the excess of NH_3 contained in an aqueous urea solution, coming, at 150°–230° C., from a former stripping, isobaric with the urea synthesis, and containing also CO_2 as ammonium carbamate, the CO_2 being at most 25% b.w. of the urea, wherein the displacement is performed by means of a CO_2 stripping within a falling-film exchanger, hereinafter CO_2 stripper, isobaric too with said synthesis, the amount of carbamate leaving the bottom of the CO_2 stripper being substantially equal to (or comprised between 100 and 150% of) the amount of carbamate entering the same stripper, characterized in that the global NH_3:CO_2 ratio, in the solution entering the CO_2 stripper, is from 2 to 8 b.w. and in that heat is supplied only to the uppermost portion of the pipes of the CO_2 stripper, wherein the surface ratio between the lowermost portion and said uppermost portion is at least 1:1 and wherein the residence time ratio between said lowermost portion and said uppermost portion is at least 1/1, the residence time in said uppermost portion being from 1 to 3 s.

4,613,698

PROCESS FOR THE PREPARATION OF 6-CHLORO-2,4-DINITROANILINE

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,050

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407566; Mar. 9, 1984, 3408631

Int. Cl.[4] C07C *85/24*

U.S. Cl. 564—412 **2 Claims**

1. A process for the preparation of 6-chloro-2,4-dinitroaniline by chlorination of 2,4-dinitroaniline with sodium hypochlorite in water using acid, which comprises carrying out the chlorination in the presence of a mineral acid or strong organic acid at a pH value $\leqq 0$ and in the presence of a dispersing agent at temperatures of about 40° to 50° C. and, when the chlorination has ended, either (a) filtering the resulting acid aqueous dispersion hot and washing the filtered reaction product with hot aqueous alkali solution, or (b) initially rendering the resulting acid aqueous dispersion alkaline with aqueous alkali solution and then filtering the mixture hot and subsequently washing the filtered reaction product with hot dilute mineral acid.

4,613,699

PHOSPHINE OXIDES AND THEIR USE AS FLAME RETARDANTS IN STYRENE MODIFIED POLYPHENYLENE ETHER RESINS

Joseph Green, East Brunswick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Mar. 1, 1985, Ser. No. 707,366

Int. Cl.[4] C07F *9/53*

U.S. Cl. 568—15 **5 Claims**

1. A phosphine oxide compound represented by the formula:

$$R_n—\overset{\overset{O}{\|}}{P}—(AZ)_{3-n}$$

wherein P is phosphorus, O is oxygen, A is an alkylene chain of 2 to 12 carbon atoms, Z is a polar group, n is 1 or 2, and R is aan alicyclic hydrocarbon or alcohol selected from the group consisting of alpha pinene, norbornylene, norbornadiene, camphene, dicyclopentadiene, vinyl norbornylene, 5-ethylidene-2-norbornene, terpineol and geraniol.

4,613,700

PROCESS FOR PRODUCING AROMATIC ALDEHYDES

Takao Maki, Kanagawa, and Toshiharu Yokoyama, Tokyo, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,475

Claims priority, application Japan, Jan. 18, 1984, 59-6967; May 17, 1984, 59-98979

Int. Cl.[4] C07C *45/41*

U.S. Cl. 568—435 **8 Claims**

1. A process for producing an aromatic aldehyde by catalytic hydrogenation of an aromatic carboxylic acid, wherein the improvement comprises using a catalyst comprising zirconium oxide containing as an essential component at least one element selected from the group consisting of chromium, manganese, iron, cobalt, zinc, lead, and indium.

4,613,701

RECOVERY OF RHODIUM FROM HYDROFORMYLATION REACTION PRODUCT

James R. Strong, Bay City, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 19, 1985, Ser. No. 777,648
Int. Cl.[4] C07C 45/50
U.S. Cl. 568—454 6 Claims

1. In a process for hydroformylating an alkene of 2 to about 10 carbon atoms having a double bond in the alpha position by (a) reacting said alkene at about 80° C. to 150° C. with carbon monoxide and hydrogen in the presence of a liquid reaction medium containing as hydroformylation catalyst a complex of rhodium with triphenylphosphine and carbon monoxide to produce a liquid reaction mixture comprising triphenylphosphine, an aldehyde derivative of said alkene having one carbon atom more than said alkene, and reaction by-products; (b) stripping said liquid reaction mixture by gas stripping, distillation, or evaporation during the course of said hydroformylation reaction to remove overhead from said reaction mixture a vapor stream comprising said aldehyde derivative, (c) recovering a crude product condensate comprising said aldehyde derivative from said vapor stream, and (d) distilling the bulk of the aldehyde out of said condensate leaving behind a crude reaction heavy ends mixture, the improvement which comprises:

separating said crude reaction heavy ends mixture by distillation into an aldehyde product distillate comprising said aldehyde derivative and a first distillation residue comprising substantially the entirety of those components of said reaction heavy ends mixture which are less volatile than said aldehyde derivative; and

redistilling said first distillation residue to separate said first distillation residue into (1) a redistillation overhead stream comprising those components of the crude reaction heavy ends mixture which are more volatile than triphenylphosphine and (2) a redistillation residue stream comprising those components of the crude reaction heavy ends mixture which are equal to or lower than triphenylphosphine in volatility and including any rhodium moiety initially contained in said vapor stream.

4,613,702

ALDEHYDE PRODUCTION BY HYDROCARBONYLATION OF ORGANIC HALIDES

Philippe Leconte, Lyons, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 15, 1985, Ser. No. 734,133
Claims priority, application France, May 15, 1984, 84 07697
Int. Cl.[4] C07C 45/49, 45/00
U.S. Cl. 568—490 25 Claims

1. A process for the preparation of an aldehyde, comprising catalytically hydrocarbonylating an organic halide having the general formula

$$R—CH_2X \quad (II)$$

in which R is a hydrogen atom, an alkyl radical or an aryl radical and X denotes a halogen atom with gaseous admixture of hydrogen and carbon monoxide in the presence of a basic neutralizing agent for the hydrogen acid produced thereby, said hydrocarbonylation being carried out in an inert, liquid carboxylic acid reaction medium.

4,613,703

PROCESS FOR ALLYLATING HYDROXYAROMATIC COMPOUNDS

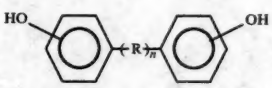
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 5, 1982, Ser. No. 365,137
Int. Cl.[4] C07C 41/16
U.S. Cl. 568—640 20 Claims

1. A process which comprises contacting an allyl halide of formula I,

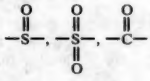
$$H_2C{=}CH{—}CH_2X$$

wherein X is Cl, Br or I, with a hydroxyaromatic compound of formula II,



II

wherein R is independently —O—, —S—, —S—S—,



or a divalent hydrocarbon group having from 1 to about 8 carbon atoms, and wherein n is zero or one; in the substantial absence of an organic solvent and in the presence of an alkaline agent and a catalytic amount of a quaternary salt represented by formula III

III

wherein Z is a tetravalent ammonium or phosphonium ion, A is any suitable counterion, and each R_1, R_2, R_3 and R_4 is independently an alkyl, aromatic or alkyl aromatic moiety containing from 1 to about 18 carbon atoms; and under reaction conditions sufficient to form a composition which includes the C-allylated and, optionally, O-allylated diallylated aromatic compounds which correspond structurally to be hydroxyaromatic compound of formula II.

15. The process of claim 1 wherein the percent diallylation is greater than 91.4 mole percent.

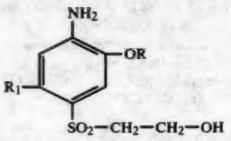
4,613,704

PROCESS FOR THE PREPARATION OF 5-HYDROXYETHYLSULFONYL-2-AMINOPHENOL (ETHERS)

Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

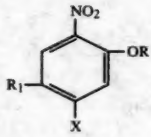
Filed Nov. 29, 1984, Ser. No. 675,979
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343421
Int. Cl.[4] C07C 85/11, 84/00
U.S. Cl. 564—418 3 Claims

1. A process for the preparation of a 5-hydroxyethylsulfonyl-2-aminophenol (ether) of the formula (I)



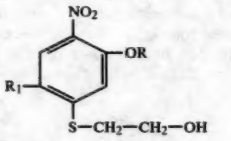
(I)

in which R denotes a hydrogen atom or an alkyl group with 1–4 carbon atoms and R_1 denotes a hydrogen atom or an alkyl or alkoxy group with in each case 1–4 carbon atoms, which comprises condensing with sufficient water to insure adequate stirrability a 5-chloro (or bromo)-2-nitrophenol or alkyl ether thereof of the formula (II)



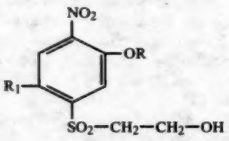
(II)

in which R and R_1 have the abovementioned meanings and X denotes a chlorine or bromine atom, with thioglycol to give a 2-nitrophenol(ether) 5-hydroxyethyl-sulfide of the formula (III)



(III)

in which R and R_1 have the abovementioned meanings, oxidizing this product, with or without intermediate isolation, to give a 5-hydroxyethylsulfonyl-2-nitrophenol (ether) of the formula (IV)



(IV)

and reducing the latter to give a compond of the above formula (I).

4,613,705

CATALYTIC ALKYLATION OF AROMATIC AMINES WITH ALKANOLS

Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 25, 1984, Ser. No. 624,533
Int. Cl.[4] C07C *85/24*
U.S. Cl. 564—409 **12 Claims**

1. A process for alkylating aromatic amines comprising the step of reacting (a) an aromatic amine having at least one replaceable hydrogen atom on an amine group or on an aromatic ring carrying an amino group or both, with (b) an alkanol in the presence of a mixed metal oxide alkylation catalyst consisting of at least about 70% by weight of at least one Group V-B metal oxide and up to about 30% by weight of stannic oxide so that alkylation of the aromatic amine occurs and so that at least a substantial portion of the alkanol not consumed in the alkylation reaction passes through the alkylation zone undecomposed.

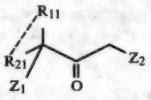
4,613,706

ISOMER-DIRECTED PROCESS FOR PRODUCING ASYMMETRIC KETONES USING CATALYTIC CLAISEN REARRANGEMENT OF ALLYLIC ETHERS, INTERMEDIATES, AND USES OF PRODUCTS AND INTERMEDIATES OF PROCESS IN PERFUMERY

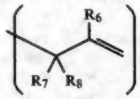
Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge; William L. Schreiber, Jackson, and Michael Licciardello, Little Silver, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 671,473, Nov. 14, 1984, Pat. No. 4,576,741, which is a continuation of Ser. No. 602,646, Apr. 20, 1984, Pat. No. 4,548,743. This application Aug. 13, 1985, Ser. No. 765,231
Int. Cl.[4] C07C *45/51*
U.S. Cl. 568—322 **10 Claims**

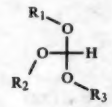
1. A mixture of asymmetric ketones defined according to the structure:



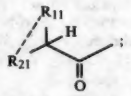
wherein one of Z_1 or Z_2 is the moiety:



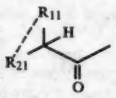
and the other of Z_1 or Z_2 is hydrogen; wherein (i) one of R_{11} or R_{21} represents hydrogen and the other of R_{11} or R_{21} represents a moiety selected from the group consisting of n-pentyl and phenylmethyl or (ii) R_{11} and R_{21} taken together form a 3,3-dimethylcyclohexyl moiety; and wherein R_6, R_7 and R_8 are the same or different and each represents hydrogen or methyl, produced according to the process comprising the steps of reacting a trialkylorthoformate having the structure:



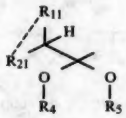
with a ketone having the structure:



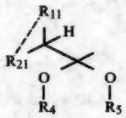
wherein R_1, R_2 and R_3 are the same or different C_1–C_3 lower alkyl at a temperature in the range of from −10° C. up to 50° C., with the mole ratio of ketone having the structure:



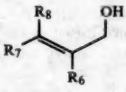
to trialkylorthoformate is from 1:1 up to 1:2 whereby a ketal having the structure:



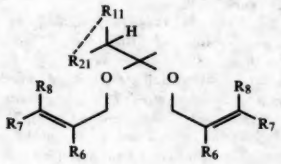
is formed; then reacting the ketal having the structure:



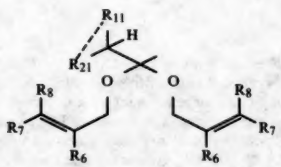
with an allylic alcohol having the structure:



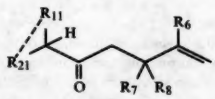
at a temperature of from 120° C. up to 220° C. with the mole ratio of ketal:allylic alcohol being from 1:1 up to 1:3, in order to form a diallyl ketal having the structure:



wherein R_4 and R_5 each represents one of R_1, R_2 or R_3; and then effecting a Claisen rearrangement of the diallylic ketal having the structure:

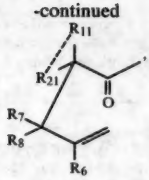


in the presence of a basic catalyst which is an alkali metal alkanoate at a temperature in the range of from 120° C. up to 150° C., the mole percent of basic catalyst in the reaction mass varying from about 0.01% up to about 0.40 mole percent, the reaction mass being maintained at a pH of between 7 and 11 and then distilling the reaction product, the mixture of isomers thus produced having the structures:

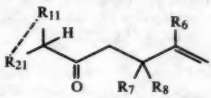


and

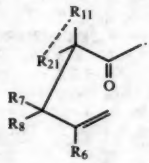
-continued



from the reaction mass by means of fractional distillation; with more than 50% of the reaction product containing the isomer having the structure:



and less than 50% of the reaction product being an isomer having the structure:



4,613,707

HYDROGENATION USING COPPER ALUMINUM BORATE CATALYST

Jay K. Kouba, Downers Grove, and Alex Zletz, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 11, 1985, Ser. No. 710,016
Int. Cl.[4] C07C *29/136, 29/14*
U.S. Cl. 568—864 **9 Claims**

1. The reduction of organic compounds to the corresponding hydroxy compounds which comprises contacting a suitable organic compound selected from the group consisting of organic carboxylic acid compounds, aldehydes and ketones with a reducing agent in the presence of a catalyst comprising at least one member selected from the group consisting of copper aluminum borate and zero valent copper on a crystalline $Al_4B_2O_9$ support wherein said catalyst is formed by the reduction of crystalline copper aluminum borate having the significant x-ray diffraction lines set forth in Table A.

4,613,708

BRANCHED PERFLUOROALKYL-1,2-ETHENES, THEIR PREPARATION AND THEIR USE AS OXYGEN CARRIERS

Jean Riess, Falicon; Francois Jeanneaux; Maurice Le Blanc, both of Nice, and André Lantz, Vernaison, all of France, assignors to Produits Chemiques Ugine Kuhlmann, Paris, France

Filed Feb. 18, 1983, Ser. No. 467,648
Claims priority, application France, Mar. 26, 1982, 82 05165
Int. Cl.[4] C07C *21/18*
U.S. Cl. 570—136 **20 Claims**

1. Trans-isomers of bis-(perfluoroalkyl)-1,2-ethenes having the general formula:

$$R_F—CH=CH—R'_F$$

in which the R_F and R'_F groups represent C_nF_{2n+1} radicals, at least one of which is branched, and where n ranges from 3 to 20 for the branched groups and from 1 to 20 for the straight groups.

4,613,709

PROCESS FOR THE PYROLYTIC DEHYDROCHLORINATION OF HALOALKANES IN THE PRESENCE OF AN INITIATOR BASED ON CHLORINATED PRODUCT AND THE INITIATOR EMPLOYED IN SUCH A PROCESS

James Franklin, Brussels, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed Aug. 15, 1985, Ser. No. 765,966
Claims priority, application France, Aug. 20, 1984, 8413050
Int. Cl.[4] C07C *17/34*
U.S. Cl. 570—227 **9 Claims**

1. Process for the pyrolytic dehydrochlorination of haloalkanes in the presence of a chlorinated product serving as a radical initiator, characterised in that the radical initiator used comprises decachlorobutane or an octachlorobutene or a mixture thereof.

4,613,710

PROCESS FOR THE PREPARATION OF (±)-3A-6,6,9A-TETRAMETHYLPERHYDRONAPHTO[2,1-B]FURAN

George H. Büchi, and Hans Wüest, both of Cambridge, Mass., assignors to Firmenich SA, Geneva, Switzerland

Filed Aug. 8, 1984, Ser. No. 638,791
Int. Cl.[4] C07C *35/23*
U.S. Cl. 568—819 **1 Claim**

1. A process for the preparation of 1β-(2-hydroxyethyl)-perhydro-2,5,5,8aβ-tetramethyl-2β-trans-naphthalenol which comprises the following steps:

a. adding an alkyl halide to methyl perhydro-5,5,8aβ-trimethyl-2-oxo-1β-trans-naphtalenecarboxylate in the presence of sodium hydride;

b. heating at temperature near its boiling point a solution in xylene of the obtained methyl 2-allyloxy-3,4,4a,5,6,7,8,8a-octahydro-5,5,8a-trimethyl-1-trans-naphthalene-carboxy late;

c. treating at reflux with calcium chloride a solution in dimethylsulfoxide of resulting methyl 1-allyl-perhydro-5,5,8aβ-trimethyl-2-oxo-1β-trans-naphthalene-carboxylate;

d. adding, under the conditions of a Grignard type reaction, a methyl magnesium halide to 1β-allyl-perhydro-5,5,8aβ-trimethyl-2-trans-naphthaleone obtained from step c. above to give 1β-allyl-perhydro-2,5,5,8aβ-tetramethyl-2β-transnaphthalenol; and

e. ozonizing said naphthalenol in the presence of ozone as an ozoning agent at a temperature between about −20° to about −30° C., and reducing the obtained product in the presence of an alkali metal borohydride as a reducing agent at a temperature between about −60° C. to about room temperature to give the desired 1β-(2-hydroxyethyl)-perhydro-2,5,5,8aβ-tetramethyl-2β-trans-naphthalenol.

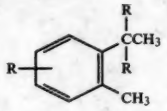
4,613,711

INDENES BY CATALYTIC DEHYDROCYCLIZATION

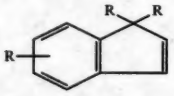
S. Erik Pedersen, Solon; Wilfrid G. Shaw, Lyndhurst, and Linda L. Pfingsten, Columbia, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 25, 1985, Ser. No. 801,355
Int. Cl.[4] C07C *12/64*
U.S. Cl. 585—411 **6 Claims**

1. A process which comprises the vapor phase dehydrocyclization of an alkylaromatic of the formula:



in the presence of H_2S and a solid catalyst to make an indene of the formula



wherein each R is independently selected from H, a C_1 to C_4 alkyl group, and phenyl wherein said catalyst is the products of sulfiding a solid catalyst precursor having 2–40 weight percent of at least one oxide selected from CoO, NiO, MoO_3 and WO_3 on 60–98 weight percent of an alumina support, said sulfiding comprising treating said catalyst precursor at an elevated temperature with a mixture of gases containing hydrogen sulfide and hydrogen, said catalyst having a surface area (BET method) less than 100 m^2/gm.

4,613,712

ALPHA-OLEFIN POLYMERS AS LUBRICANT VISCOSITY PROPERTIES IMPROVERS

Robert F. Bridger, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,699
Int. Cl.[4] C10L *1/16*
U.S. Cl. 585—10 **61 Claims**

1. A lubricating composition comprising a major proportion of a lubricant and a viscosity index (VI) improving amount of an atactic polymer of at least one C_5–C_{22} alpha-olefin, prepared by polymerizing at least one C_5–C_{22} alpha-olefin monomer in the presence of a catalyst prepared by a process comprising the steps of:

(i) contacting a solid, porous carrier having reactive OH groups with a liquid in the absence of ball milling, said liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R is unsubstituted C_1–C_{12} alkyl, R' is Cl, Br or I, and n is a rational number from about 0.5 to 2, the number of moles of said organomagnesium composition being in excess of the number of moles of said OH groups on said carrier, whereby said organomagnesium composition is reacted with said OH groups on said carrier;

(ii) evaporating said liquid from step (i) to precipitate magnesium onto said carrier, said precipitated magnesium being selected from the group consisting of magnesium dihalide, unreacted organomagnesium composition and mixtures thereof, whereby a supported magnesium composition in the form of a dry, free-flowing powder is formed; and

(iii) reacting said powder of step (ii) with at least one tetravalent titanium compound in a liquid medium, the number of moles of said tetravalent titanium compound being in excess of the number of the OH groups on said carrier prior to reaction with said organomagnesium composition in step (i), said tetravalent titanium compound being soluble in said liquid medium, and said supported magnesium composition being substantially insoluble in said liquid medium, whereby a reacted form of titanium which is insoluble in said liquid medium becomes supported on said carrier.

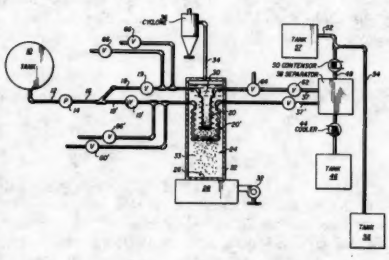
4,613,713
METHOD AND APPARATUS FOR PYROLYSIS OF ATACTIC POLYPROPYLENE

H. Kenneth Staffin, New Brunswick, and R. B. Roaper, Martinsville, both of N.J., assignors to Procedyne Corp., New Brunswick, N.J.

Division of Ser. No. 443,235, Nov. 22, 1982. This application May 22, 1984, Ser. No. 613,087

Int. Cl.[4] C07C *4/04;* C10G *9/16;* C10B *43/10, 51/00*

U.S. Cl. 585—241 **10 Claims**



1. A method for pyrolizing polymeric materials, which comprises: melting the polymeric material prior to passing it thru a reactor and conduit;

passing the polymeric material thru the reactor conduit disposed in a fluidized bed thereby exposing the polymeric material to pyrolizing temperatures causing it to decompose into lower molecular weight fragments whereby the fluidized bed heats the polymeric material to pyrolizing temperatures causing it to decompose cleaning carbonaceous deposits from the reactor conduit by exposing the deposits to oxygen at sufficient temperatures to cause combustion of said deposits and contacting surfaces of the reactor conduit with fluidized particles of the fluidized bed to conduct heat away from the surfaces at a rate sufficiently high to permit rapid combustion of the deposits without damage to the surface of the reactor conduit.

4,613,714
CATALYST AND PROCESS FOR THE SELECTIVE HYDROGENATION OF MULTI-UNSATURATED ORGANIC COMPOUNDS

Karl-Heinz Stadler, Augsburg, and Karel Kochloefl, Moosburg, both of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 614,638, May 28, 1984, abandoned. This application Oct. 8, 1985, Ser. No. 785,472

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1983, 3320388

Int. Cl.[4] C07C *5/05*

U.S. Cl. 585—271 **10 Claims**

1. Process for the selective hydrogenation of highly-unsaturated organic compounds in a mixture of hydrocarbons, which comprises the steps of:

A. contacting said mixture of hydrocarbons with hydrogen in the presence of a catalyst comprising:

B. a metal component of an element of Group VIII of the Periodic Table on

C. a support material, selected from the group consisting of: (c_1) one or more n-semiconducting oxides of one or more elements from Subgroups IVb, Vb and VIb of the Periodic Table or of thorium or cerium, and

D. in which the hydrogen chemisorption capacity, expressed as the atomic ratio between chemisorbed hydrogen atoms and metal atoms of the metal component (A), present on the surface of the metal particles, (H/Me_A) is at least 0.6:1.

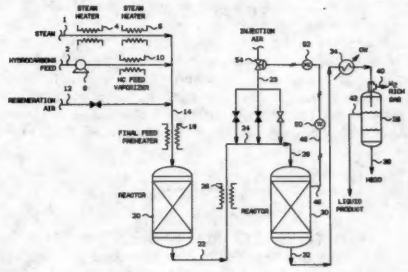
4,613,715
OXYGEN ADDITION TO A STEAM-ACTIVE DEHYDROGENATION REACTOR

Donald M. Haskell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1985, Ser. No. 754,313

Int. Cl.[4] C07C *2/82*

U.S. Cl. 585—412 **20 Claims**



1. A process for the dehydrocyclization of hydrocarbons comprising the steps of contacting a feed stream, which comprises steam and at least one hydrocarbon selected from the group consisting of normal alkanes and isoalkanes containing 6–12 carbon atoms per molecule, with at least one bed of dehydrocyclization catalyst comprising at least one Group VIII metal and at least one support material selected from the group consisting of Group IIA and Group IIB metal aluminate spinels thus forming a reaction mixture, and heating said reaction mixture under such reaction conditions as to produce aromatic hydrocarbons containing from 6 to 12 carbon atoms per molecule, wherein a free oxygen containing gas is injected into said reaction mixture in at least one location downstream of the point where said feed stream is first contacted with said bed of catalyst and the mol ratio of injected oxygen to the hydrocarbon feed is in the range of from about 40:100 to about 200:100.

4,613,716
PRODUCTION OF AROMATICS FROM ETHANE AND/OR ETHYLENE

Timothy K. McNiff, Weybridge, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Oct. 17, 1985, Ser. No. 788,338

Claims priority, application United Kingdom, Nov. 16, 1984, 8429007

Int. Cl.[4] C07C *12/02*

U.S. Cl. 585—415 **11 Claims**

1. A process for producing aromatic hydrocarbons, said process comprising bringing into contact in the vapour phase at a temperature from 500°–750° C. a hydrocarbon feedstock containing at least 10% by weight of C_2 hydrocarbons with a catalyst composition comprising (i) an aluminosilicate loaded with gallium as a gallium compound and/or as gallium ions and having a silica to alumina molar ratio of at least 5:1, and (ii) a compound of the metal rhenium or iridium.

4,613,717

PROCESS FOR PRODUCING A 1,4-DIALKYLBENZENE

Hiroshi Ishida, and Hitoshi Nakajima, both of Kurashiki, Japan, assignors to Research Association for Utilization of Light Oil, Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,629

Claims priority, application Japan, Jun. 25, 1984, 59-129169; Jul. 20, 1984, 59-149316; Jul. 25, 1984, 59-153049

Int. Cl.[4] C07C 2/66

U.S. Cl. 585—467 12 Claims

1. A process for producing a 1,4-dialkylbenzene which comprises contacting benzene or a monoalkylbenzene with an alkylating agent in the vapor phase in the presence of a catalyst obtained by subjecting a zeolite to a treatment with a gas containing a silicic acid ester and then a calcination in an oxygen-containing gas, said zeolite being a metallosilicate having a molar ratio of SiO_2/X_2O_3 in which X is at least one member selected from the group consiting of Al, B and Cr, of 10 or more and having a constraint index within the range of 1 to 15.

4,613,718

HYDROXYLATED MAGNESIA SUPPORT

John A. Jaecker, and Marvin F. L. Johnson, both of Homewood, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,912

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] C07C 2/00

U.S. Cl. 585—500 13 Claims

1. In an improved method for converting a gas comprising methane to higher hydrocarbons which comprises contacting said gas with a contact agent, said contact agent comprising:

(a) a component of at least one metal, the oxide of which is reduced and produces higher hydrocarbons and water when contacted with methane at a selected temperature in the range of about 500° to about 1000° C., and

(b) a support,

the improvement which comprises employing said contact agent wherein said support comprises hydroxylated magnesia.

4,613,719

OLIGOMERIZATION OF OLEFINS

Simon G. Kukes; Gerhard P. Nowack, and Robert L. Banks, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 17, 1985, Ser. No. 788,297

Int. Cl.[4] C07C 2/02

U.S. Cl. 585—528 18 Claims

1. A process for oligomerizing olefins comprising the step of substantially simultaneously contacting:

(a) a feed stream which contains at least one olefin having from 2 to 4 carbon atoms per molecule,

(b) a free hydrogen containing gas, and

(c) a solid catalyst composition comprising at least one compound containing chemically bound copper, phosphorus and oxygen, under such reaction conditions as to obtain a reaction product comprising at least one hydrocarbon having from 5 to 12 carbon atoms per molecule.

4,613,720

BORON-TREATED ZEOLITE CATALYST FOR PREPARING LIGHT MONOOLEFINS

Cristobal Bonifaz, Greenville, Del.; David R. Corbin, West Chester, Pa., and John B. Parise, New South Wales, Australia, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1986, Ser. No. 818,806

Int. Cl.[4] C07C 1/20

U.S. Cl. 585—640 7 Claims

1. A process for preparing light monoolefins from a feed stream comprising a reactant consisting of methanol, dimethyl ether, or a mixture thereof, comprising contacting the feed stream at a weight hourly space velocity of greater than about 0.5 h^{-1} with an aluminosilicate zeolite catalyst at a temperature of from about 350° to about 600° C. and a pressure of from about 20 to about 3000 kPa to convert at least about 85 weight percent of the reactant to hydrocarbons comprising at least 60 weight percent ethylene and propylene, said 85 weight percent conversion being achieved before the contacting has exceeded 0.3 gram of reactant per gram of catalyst;

said aluminosilicate zeolite catalyst comprising an aluminosilicate zeolite having a silica to alumina ratio of less than about 12; said aluminosilicate zeolite catalyst being prepared by depositing a boron containing species on the surface region of the aluminosilicate zeolite; said aluminosilicate zeolite catalyst having a boron to aluminum atom ratio in the surface region of the catalyst of less than about 1.3.

4,613,721

SMALL OLEFIN INTERCONVERSIONS

Steven W. Kaiser, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 551,888, Nov. 15, 1983, Pat. No. 4,527,001. This application May 6, 1985, Ser. No. 730,948

Int. Cl.[4] C07C 6/00

U.S. Cl. 585—643 29 Claims

1. Process for the interconversion of ethylene, propylene and butenes comprising contacting an olefin feed containing at least one of ethylene, propylene and butenes with at least one non-zeolitic molecular sieve, "NZ-MS", selected from the group consisting of FAPO, TAPO, MnAPO, CoAPO, MAPO and ZnAPO and characterized by an adsorption for n-hexane of more than 2 percent by weight at 400 torr and at 24.0° C. and by an adsorption for isobutane of less than 2 percent by weight at a pressure of 100 torr and a temperature of 24° C., at effective olefin interconversion conditions for the interconversion of ethylene, propylene and butenes.

4,613,722

DEHYDROGENATION OF C_3 AND C_4 HYDROCARBONS OVER AN IRON-BASED CATALYST

John H. Kolts, Ochelata, and Gary A. Delzer, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1985, Ser. No. 758,940

Int. Cl.[4] C07C 4/02

U.S. Cl. 585—651 16 Claims

1. A method for converting feed hydrocarbons comprising at least one of C_3 and C_4 hydrocarbons to less saturated product hydrocarbons, comprising:

contacting feed hydrcarbons comprising at least one of C_3 and C_4 hydrocarbons, in the presence of steam, with a catalyst composition selected from the group consisting of:

(a) a catalyst composition consisting essentially of: (1) a minor amount of at least one oxide of iron and (2) a major amount of at least one oxide of magnesium;

(b) a catalyst composition consisting essentially of (1) a minor amount of at least one oxide of iron, (2) a minor amount of at least one oxide of manganese and (3) a major amount of at least one oxide of magnesium;

(c) a catalyst composition comprising: (1) a minor amount of at least one oxide of iron and (2) a major amount of at least one oxide of at least one metal of the Lanthanum Series; and

(d) a catalyst composition comprising: (1) a minor amount of at least one oxide of iron and (2) a major amount of at least one oxide of niobium,

under conditions sufficient to convert said feed hydrocarbons to said less saturated product hydrocarbons.

4,613,723

PROCESS FOR EFFECTING HYDROCARBON ISOMERIZATION OR ALKYLATION

George A. Olah, Beverly Hills, Calif., assignor to PCUK-Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation-in-part of Ser. No. 164,950, Jul. 1, 1980, abandoned, which is a division of Ser. No. 23,676, Mar. 26, 1979, abandoned. This application Jan. 3, 1984, Ser. No. 568,273

Int. Cl.[4] C07C *2/58, 5/13*

U.S. Cl. 585—730 12 Claims

1. An isomerization process which comprises continuously passing an isomerizable C_4 to C_{30} hydrocarbon over a catalyst comprising a C_{10} to C_{18} perfluorinated alkanesulfonic acid which is deposited or absorbed upon a suitable support and having bonded thereto from between about 1 and 50 percent by weight of the total catalyst composition of a Lewis acid fluoride selected from the elements of Group IIA, IIIA, IVB, VA, VB, or VIB of the Periodic Table to effect a continuous heterogeneous flow isomerization of the hydrocarbon at a temperature between about 0° and 250° C. and at a pressure between atmospheric and about 25 atmospheres.

8. An alkylation process which comprises continuously passing an alkylatable hydrocarbon and an alkylating agent over a catalyst comprising a C_{10} to C_{18} perfluorinated alkanesulfonic acid which is deposited or absorbed upon a suitable support and having bonded thereto from between about 1 and 50 percent by weight of the total catalyst composition of a Lewis acid floride selected from the elements of Group IIA, IIIA, IVB, VA, VB, or VIB of the Periodic Table to effect a continuous heterogeneous flow alkylation of the hydrocarbon at a temperature between about 50° and 250° C. and at a pressure between atmospheric and about 50 atmospheres.

4,613,724

PROCESS FOR REMOVING CARBONYL-SULFIDE FROM LIQUID HYDROCARBON FEEDSTOCKS

Guy L. G. Debras, Belgrade; Georges E. M. J. De Clippeleir, Sint-Pieters-Leeun, and Raymond M. Cahen, Brussels, all of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Jul. 9, 1985, Ser. No. 753,288

Int. Cl.[4] C07C *7/00, 11/00*

U.S. Cl. 585—824 20 Claims

1. A process for removing carbonyl sulfide from a liquid olefinic hydrocarbon feedstock comprising:

(a) passing said hydrocarbon feedstock over an absorbent material comprising zinc oxide and a promoter selected from the group consisting of alumina, silico-aluminas and any combination thereof wherein the promoter is present in amounts from about 3 to about 15 percent by weight of the absorbent material; and

(b) recovering a liquid olefinic hydrocarbon stream having a substantially reduced carbonyl sulfide content.

4,613,725

PROCESS FOR SEPARATING ETHYLBENZENE FROM XYLENES BY SELECTIVE ADSORPTION ON A RUBIDIUM SUBSTITUTED X ZEOLITE

Denise M. Barthomeuf, Lyons, France, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 666,197, Oct. 29, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 814,155

Int. Cl.[4] C07C *7/13*

U.S. Cl. 585—828 10 Claims

1. A process for the separation of ethylbenzene from a feedstream containing ethylbenzene and at least one xylene isomer comprising the steps of:

(a) contacting the feedstream with a Rb-exchanged Type X zeolite under conditions for adsorbing ethylbenzene by the zeolite,

(b) passing a desorbent selected from the group consisting of n-propylbenzene, n-butylbenzene, n-pentylbenzene, n-heptylbenzene, and n-nonylbenzene through the zeolite during and after the contacting step,

(c) recovering a stream enhanced in ethylbenzene content from the zeolite.

4,613,726

PROCESS FOR REMOVING NICKEL, ALUMINUM AND CHLORINE FROM OLEFIN OLIGOMERS

Yves Chauvin, Le Pecq; Dominique Commereuc, Meudon; Daniel Cruypelinck, Nanteuil le Haudoin; Francois Hugues, Nanterre, and Georges Vidouta, Aubergeaville, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 27, 1985, Ser. No. 749,166

Claims priority, application France, Jun. 27, 1984, 84 10291

Int. Cl.[4] C07C *7/148*

U.S. Cl. 585—861 20 Claims

1. In a process for removing aluminum, nickel and chlorine compounds from a liquid hydrocarbon reaction product obtained by oligomerization and/or co-oligomerization in liquid phase of monolefins having 2 to 4 carbon atoms, in the presence of a catalyst obtained by interaction of a nickel compound soluble in hydrocarbons with an organo-aluminum chloride, comprising the steps:

(a) treating the product with anhydrous ammonia,

(b) treating the resultant product of step (a) with an aqueous solution of at least one alkali metal hydroxide, and

(c) separating the aqueous phase, and recovering the organic phase,

the improvement comprising treating the product of step (a) with at least one aqueous solution of at least one hydroxy-acid or at least one alkali metal salt of said hydroxy-acid, said treatment being performed before step (b), after step (b) or simultaneously with said step.

4,613,727

ELECTRICAL INSULATOR COLUMN WITH FIBER OPTIC CABLE AND GAS SUPPLY TUBE

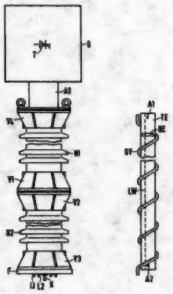
Tibor Salanki, Erlangen, and Norbert Hess, Wiesenthau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jul. 15, 1985, Ser. No. 755,175

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426536

Int. Cl.[4] H01B *17/14, 17/36;* G02B *6/00*

U.S. Cl. 174—30 6 Claims



1. An electrical insulator column having at least one hermetically sealed, hollow insulator filled with an insulating material providing mechanical support and insulation from a reference potential of a high voltage carrying assembly, comprising:

at least one fiber optic cable conducted through the electrical insulator column in a hermetically sealed manner; and

a support element, providing fixed-mounted support for the fiber optic cable, fixedly mounting to the insulator column, and having a limited electrical conductivity surface enabling the support element to withstand the potential difference of being connected between the high voltage of the site of the assembly and the reference potential site.

4,613,728

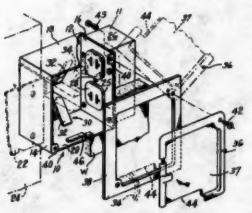
ELECTRICAL OUTLET BOX ENCLOSURE

Deborah A. Lathrop, 191 Hamilton St., Cambridge, Mass. 02139

Filed Mar. 21, 1985, Ser. No. 714,461

Int. Cl.[4] H02G *3/08*

U.S. Cl. 174—53 12 Claims



1. An enclosure apparatus adaptable for use in a building wall, to enclose at least the front panel of an electrical device, comprising:

a first and second side panel attached to an upper and a lower panel having a rear panel attached therewith, comprising an enclosure box;

means for receiving an electrical device arranged through one of said panels of said enclosure box;

means for attaching said enclosure box to a building wall;

securement means attached on the inside of one of said panels to hold any cord which is plugable into said electrical device received onto said enclosure box; and

a movable door adapted to the front side of said enclosure box, so as to thereby close said enclosure box on all sides thereof.

4,613,729

TELECOMMUNICATIONS SYSTEM, PARTICULARLY A TELEPHONE EXCHANGE SYSTEM HAVING OVERLOAD-PROTECTED SEQUENTIAL LOGIC SYSTEMS

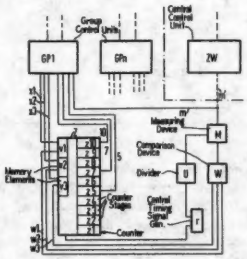
Georg Daisenberger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,557

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 33119120

Int. Cl.[4] H04M *3/36*

U.S. Cl. 179—8 A 2 Claims



1. A telecommunications system comprising:

a plurality of lines and trunks, arranged in groups, for connection to said subscriber stations and for carrying call information including initial switching identifiers and subsequent selection characters announced by said initial switching identifiers;

a central information-processing sequential logic system having a limited call-handling capability with respect to its information-processing capacity and operable to produce loadability signals;

a switching network connected to said central information-processing system;

a plurality of partially-centralized information-processing sequential logic systems each connected to a respective line/trunk group and to said central information-processing sequential logic system via said switching network, and each operable to receive intermediately store and transmit call information to said central information-processing system for processing to set up calls between calling and called subscriber stations;

traffic load measuring means connected to each of said partially-centralized information-processing sequential logic systems and responsive to said initial switching identifiers integrated over a predetermined time interval to have an integration result to repetitively produce and repetitively emit momentary control signals representing the current information processing traffic load, and including loadability measuring means connected to said central information-processing system and operable to produce loadability control signals; and

a plurality of cyclically-deincremented counting means each connected to a respective partially-centralized information-processing sequential logic device and to said traffic load measuring means, each of said counting means incremented by numbers of steps indicated by said traffic load control signals and operable to produce and transmit an overload signal to the respective partially-centralized information-processing sequential logic system upon

reaching a predetermined count representing a traffic load limiting value defined by said loadability control signals until reattainment of the limiting value due to cyclic deincrementation of said counting means.

4,613,730

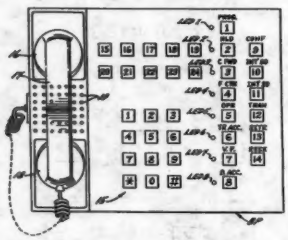
ELECTRONIC TELEPHONE WITH FEATURE ACCESS AND SPEED DIALING INCLUDING LOOP BREAKS

William A. Fechalos, Naperville, and Satyan G. Pitroda, Villa Park, both of Ill., assignors to Rockwell International Corp., El Segundo, Calif.

Filed Sep. 19, 1980, Ser. No. 188,676

Int. Cl.[4] H04M *1/00*

U.S. Cl. 179—81 R **15 Claims**



1. For use with a telephone switching system which carries out different special feature functions in response to a hook flash followed by respectively different dial digit combinations, a telephone set with tip and ring leads and having a plurality of special feature buttons individually assigned to the different special features, said telephone set comprising, in combination

(a) means responsive to momentary actuation of one of said buttons for creating in said telephone set, for a first predetermined time period, a simulated on-hook condition despite the fact that the set is off hook, and

(b) means activated at the completion of said first time period for applying to the tip and ring leads, during subsequent spaced time intervals, dial digit signals corresponding to the combination for the button which has been actuated.

4,613,731

METHOD OF CANCELLING LISTENER ECHO IN A DIGITAL DATA RECEIVER, AND DEVICE FOR IMPLEMENTING SAID METHOD

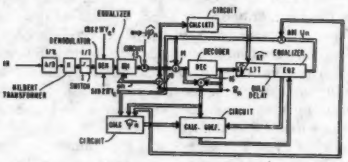
Dominique Godard, LeRouret, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 29, 1982, Ser. No. 403,193

Claims priority, application European Pat. Off., Sep. 8, 1981, 81430028.1

Int. Cl.[4] H04B *3/22*

U.S. Cl. 179—170.2 **5 Claims**



1. In a data communication system which includes means for transmitting a normal electric carrier wave modulated by data symbols at a signaling rate of 1/T baud and means for receiving a said modulated wave and a delayed parasitic echo wave thereof, said echo wave exhibiting a phase shift (ψ) with respect to said normal modulated carrier wave, a method for canceling said delayed parasitic echo wave comprising at said receiver the steps:

measuring an estimated value of the delay (KT) between said normal and parasitic waves;

demodulating the received waves to detect the data symbols;

delaying the detected data symbols by said delay (KT);

measuring the discrete values (ψn) of the said received wave echo phase shift (ψ) at predetermined time intervals nT, n being an integer value;

at said intervals generating discrete samples q_n of a listener echo replica such that:

$$q_n = \sum_{l=-L}^{L} a_{n-K-l}\, h_l \exp j\psi_n,$$

wherein:

a_{n-K-l} is an echo component of the received wave

the symbol " " means "estimated value of";

L is a predetermined integer value;

$j=\sqrt{-1}$;

a_n is the data symbol received at the nth sampling time;

exp stands for exponential;

h_l is representative of a coefficient derived at each sampling time through an iterative process according to the following expression:

$$h_{l(n+1)} = h_{l(n)} + \lambda_h \epsilon_n \exp -j\psi_n a_{n-K-l}$$

with

λ_h being a predetermined numerical coefficient; and,

ϵ_n being repesentative of the echo error value at time nT, which error is derived from the difference between the undetected and the detected received wave; and subtracting the said generated listener echo replica from the received undetected wave.

4,613,732

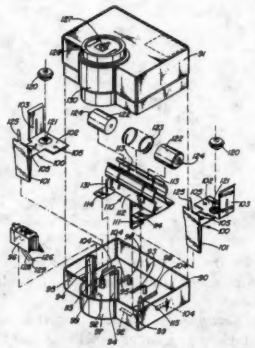
INTERFACE MODULE WITH MODULAR JACK FOR TELECOMMUNICATIONS SYSTEMS

Casimir Cwirzen, Arlington Heights, and Donald F. Jaycox, Deerfield, both of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 544,970, Oct. 24, 1983, abandoned. This application Jul. 13, 1984, Ser. No. 630,880

Int. Cl.[4] H02H *1/00*

U.S. Cl. 179—178 **12 Claims**



11. An interface module for use in telecommunications systems comprising:

a base;

a top adapted to combine with said base to form an enclosure;

tow long, thin line terminal slots and one long, thin ground terminal slot formed in said base;

means attached to said base and integral with said enclosure for receiving a modular jack;

a first and second terminal, a terminal being positioned in each line terminal slot, each terminal having a wide, thin blade portion, a support portion, and a contact portion;

a third terminal positioned in said ground terminal slot and having a wide, thin blade portion and a tubular protector holding portion; and

a protector positioned in said protector holding portion.

4,613,733

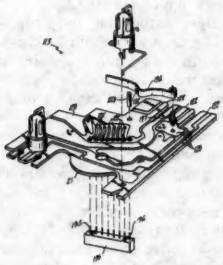
DELAY WIPER SWITCH

Robert S. Migrin, and David V. Tinder, both of Dearborn, Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 2, 1984, Ser. No. 656,841

Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—5 R **10 Claims**



1. A switch for controlling wiper delay including:

a housing;

a circuit board positioned in the housing and having a contact pattern of several parts disposed on a surface thereof, some of said contact pattern parts being arranged in an array;

a carriage movable in the housing;

electrical contact means mounted on said carriage and disposed for engagement with selected parts of said contact pattern as a function of the position of said carriage;

a discrete resistive element having at least three conductive leads extending therefrom and subdividing said resistive element into a resistor network having a plurality of resistive values, each said conductive lead of said resistive element being electrically conductively affixed to a respective one of said contact pattern parts in said array; and

said carriage being manually actuatable to said contact means into contact with successive ones of said contact pattern parts in said array to vary the interval between sweeps of a wiper.

4,613,734

RESILIENT CLAMPING DEVICE FOR SECURING AN ARC CHUTE COVER OF A SWITCHING DEVICE

Guenther Eckert, Maxhuette-Haidhof, and Franz Singer, Amberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,092

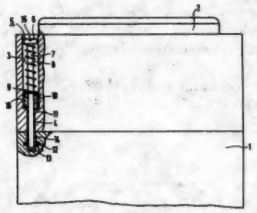
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409579

Int. Cl.[4] H01H *33/00, 9/02*

U.S. Cl. 200—144 R **10 Claims**

1. For use in a switching device, a clamping device for yieldingly securing an arc chute cover to a base of the switching device, comprising:

a first resilient element; and



a second resilient element connected to said first resilient element;

wherein said first resilient element and said second resilient element have different resiliency characteristics.

4,613,735

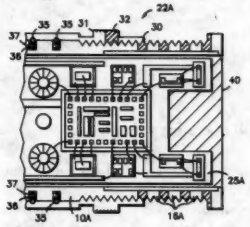
TUBULAR SWITCH PACKAGE WITH SLIDING CONTACTS FORMING A PORTION THEREOF

Gerald R. Severson, and Richard C. Wade, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,574

Int. Cl.[4] H01H *19/14;* **H01B** *3/40*

U.S. Cl. 200—158 **11 Claims**



1. A switch package comprising:

an elongated tubular base member;

a plurality of ring shaped conductors;

a plurality of ring shaped insulators, said ring shaped conductors and insulators being mounted in coaxial overlying relationship with said base member and, further, being alternately positioned in abutting engagement to provide a substantially continuous tubular sleeve over the outer surface of said base member, said tubular sleeve having an outer surface formed of alternate conducting and insulating sections;

a switching control ring having at least a portion of an inner surface thereof formed of conducting material and mounted coaxially in overlying relationship with said tubular sleeve, the inner surface of said control ring being positioned in sliding engagement with the outer surface of said tubular sleeve; and

means for providing axial movement of said switching ring along said tubular sleeve and for maintaining said switching ring in a desired axial position.

4,613,736

OPERATING PANEL

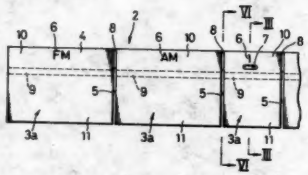
Hajime Shichijo, Fujisawa; Masamitsu Tsukatani, Chigasaki, and Takeshi Kato, Sakura, all of Japan, assignors to Sony Corporation, Tokyo, Japan

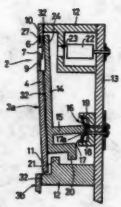
Continuation of Ser. No. 358,662, Mar. 16, 1982, abandoned. This application Dec. 6, 1984, Ser. No. 677,904

Claims priority, application Japan, Mar. 20, 1981, 56-39986[U]

Int. Cl.⁴ H01H *9/16*

U.S. Cl. 200—317 **7 Claims**





1. A switch operating panel for electronic equipment comprising:

a unitary metal plate adapted for mounting on a frame and divided into a plurality of juxtaposed switch operating parts by simultaneous etching from front and back surfaces thereof, said operating parts being separated from one another only by slits formed therebetween except for connecting parts remaining extending between said operating parts, said connecting parts formed as relatively reduced thickness on said metal plate by etching from the front surface of said metal plate,

thin wall portion hinges respectively formed on said operating parts by etching from the back surface of said metal plate, each said hinge dividing said corresponding operating part into stationary and movable parts, said stationary parts being connected to each other by said connecting parts,

display parts respectively formed only on said stationary parts by etching from the front surface of said metal plate, and

projections respectively connected to back surfaces of said movable parts for engaging associated switch means interiorly mounted on said frame, and engaging parts respectively connected to the back surfaces of said movable parts at the free ends thereof for abutting against associated stop surfaces formed on said frame to maintain said movable parts normally flush with one another.

4,613,737

LOW PROFILE PUSHBUTTON SWITCH WITH TACTILE FEEDBACK

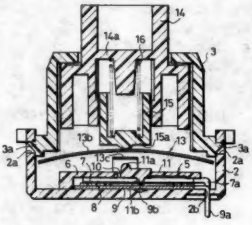
Akio Nishijima, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 4, 1984, Ser. No. 647,127

Claims priority, application Japan, Sep. 1, 1983, 58-159011

Int. Cl.⁴ H01H *3/12*

U.S. Cl. 200—340 **5 Claims**



1. A pushbutton switch comprising:

(a) a casing having a bottom wall and a top wall;

(b) a switch device disposed in said casing on said bottom wall and comprised of a relatively thin case having a flexible presser and accommodating a movable contact sheet, a spacer, and a fixed contact therein in stacked relation;

(c) a stem disposed in said casing for movement toward and away from said switch device;

(d) a plate spring disposed above said flexible presser and curved toward said stem;

(e) an actuating member disposed in said stem for movement toward and away from said switch device;

(f) a spring disposed between said actuating member and said stem for urging an upper portion of said stem to project through said top wall of said casing and also urging said actuating member into pressing contact with an upper surface of said plate spring;

(g) said flexible presser having on an upper surface a presser projection disposed near a free end of said flexible presser and on a lower surface a contact presser projection disposed further away from said free end, the stem when depressed causing said actuating member to deform the plate spring, which then engages said presser projection, and displaces it to force said contact presser to press said movable contact sheet toward said fixed contact.

4,613,738

MICROWAVE HEATING DIGESTION VESSEL

Russell H. Saville, Minnetonka, Minn., assignor to Savillex, Minnetonka, Minn.

Filed Feb. 19, 1985, Ser. No. 702,639

Int. Cl.⁴ H05B *6/80*

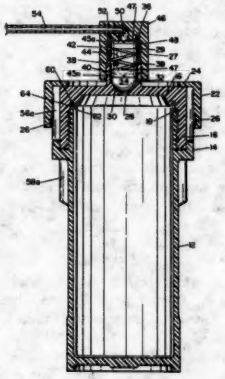
U.S. Cl. 219—10.55 R **9 Claims**

1. A microwave heating digestion vessel for use in a microwave oven during a microwave heating digestion of a material comprising:

a. molded threaded vessel and mating molded threaded lid for covering said vessel, said vessel and said lid being transparent to microwave energy;

b. valve assembly affixed to the top of said lid, said valve assembly including a ball seat with a vent opening disposed in said lid, a hollow cylindrical stem including a threaded outer portion, said cylindrical stem supporting a spring assembly therein and affixed to said lid about said ball seat, a flat positive planar stop surface at the top of said cylindrical stem and a valve cap including a threaded inner portion and an interior flat planar stop surface, said threaded valve cap covering said cylindrical stem and

retaining said spring assembly, said spring assembly acting on top of and against a ball mating in said ball seat, wherein said spring assembly comprising two opposing open cylindrical sections, a section of a spiral spring between said cylindrical sections, and a plurality of spacing



nipples extending outwardly from said open cylindrical sections and said spring section providing for passage of pressure and vapors about said cylindrical and spring sections; and

c. venting hole means disposed in said valve cap for exhausting pressure, vapors and liquid from said vessel.

4,613,739

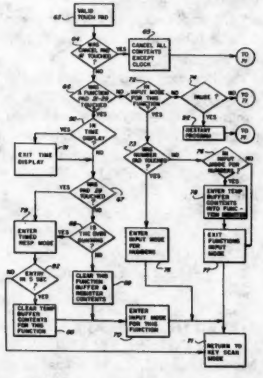
MICROCOMPUTER CONTROL FOR MICROWAVE OVEN

Paul L. Richards, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 25, 1983, Ser. No. 516,592

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 B **8 Claims**



1. In a microwave oven having means defining an oven cavity and heating means for effecting microwave energy heating of matter in said oven cavity, the improvement comprising

control means for providing selectively different programs of operation of said heating means, said programs having different cycles of operation therein, and including means for changing the selection of cycles including addition and elimination of subsequent cycles and changing the parameters of any cycles of operation during continued running of a presently running cycle of a selected program.

4,613,740

GUIDE HOLDERS OF ELECTRODISCHARGE MACHINING APPARATUS HAVING WIRE ELECTRODE

Yoshiyasu Ichikawa, Tokyo, Japan, assignor to Ogura Jewel Industry Co., Ltd., Tokyo, Japan

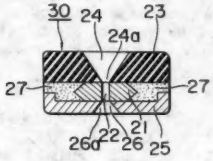
PCT No. PCT/JP83/00030, § 371 Date Oct. 5, 1983, § 102(e) Date Oct. 5, 1983, PCT Pub. No. WO83/02742, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 3, 1983, Ser. No. 548,888

Claims priority, application Japan, Jan. 12, 1983, 58-1703; Feb. 3, 1983, 57-14197

Int. Cl.⁴ B23P *1/08*

U.S. Cl. 219—69 W **7 Claims**



1. A guide holder for an electrodischarge machining apparatus having a wire electrode and a guide holder means comprising

(a) a cap of a non-conductive material having a hole through which said electrode passes,

(b) a durable wear resistant guide member body with a hole through which said electrode passes,

(c) a pedestal member which together with said cap encloses and retains said guide member body,

(d) said cap and said pedestal member each having a truncated conical hole axially aligned with the hole through said guide member body and with said electrode, the truncated hole portions of said cap and pedestal being oppositedly flared outwardly with respect to each other, and

(e) said cap, guide member body, and said pedestal being secured together by a fixing means.

4,613,741

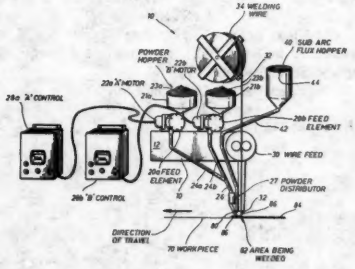
FEEDER FOR WELDS

Roman F. Arnoldy, P.O. Box 40472, Houston, Tex. 77040

Filed Oct. 3, 1984, Ser. No. 657,434

Int. Cl.⁴ B23K *9/18*

U.S. Cl. 219—73.2 **5 Claims**



1. A multiple feeder for use in welding comprising:

a body member,

a plurality of feeding elements mounted to the body member

for feeding independently of each other particulate weld material into discharge means for transmission to a weld zone,

the discharge means mounted to the body member above the weld zone, the discharge means provided with a generally central passage and a chamber about the passage for receiving and discharging the weld material,

electrode feeding means mounted to the body member for directing an electrode to the weld zone,

electrode drive means for moving the electrode to the weld zone,

means for transmitting the particulate weld material from the feeding elements to the discharge means,

each of the feeding elements having connected thereto its own drive means independent of each other element's drive means and independent of the electrode drive means, and

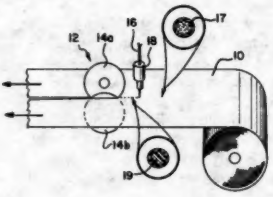
each feeding element having controllingly connected thereto its own independent control means so that the proportions of the materials fed can be independently, continuously, and accurately controlled and set as desired.

4,613,742

METHOD FOR CUTTING IMAGING SHEETS CONTAINING PHOTOSENSITIVE MICROCAPSULES

Erik K. Nelson, Centerville, and Donald L. Head, Chillicothe, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 11, 1985, Ser. No. 710,721
Int. Cl.[4] B23K *26/00*; G01C *1/72*
U.S. Cl. 219—121 LG **6 Claims**



1. A method for cutting an imaging sheet material which includes a support carrying a layer of microcapsules containing a photohardenable composition comprising:

exposing said imaging sheet material to actinic radiation along a line upon which said imaging sheet material is to be cut to harden said photohardenable composition, and

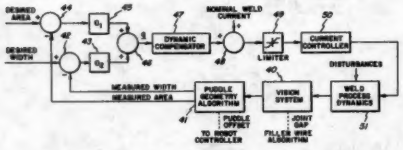
cutting said imaging sheet material along said line.

4,613,743

ARC WELDING ADAPTIVE PROCESS CONTROL SYSTEM

Herman A. Nied, Ballston Lake, and Radhakisan S. Baheti, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,786
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—130.21 **12 Claims**



9. In a robotic welding operation wherein welding current conducted by the nonconsumable electrode of a welding torch generates an electric arc whose heat forms a molten weld puddle in a workpiece, and a vision system integrated with said torch provides an image of said weld puddle and the workpiece joint to guide the torch and control the welding process, the improved method of closed-loop weld process control comprising the steps of:

analyzing said image at discrete time intervals and measuring weld puddle area;

determining a puddle geometry error from the difference between desired and measured puddle areas;

inputting said puddle geometry error to a dynamic compensator whose output determines a correction to nominal welding current; and

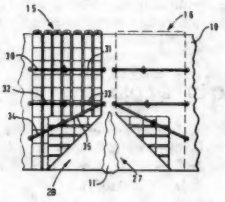
feeding said corrected welding current to said torch to change the weld puddle boundaries and regulate puddle area to assure full penetration weld beads.

4,613,744

METHODS OF REPAIR

Michael J. Fraser, Birmingham, United Kingdom, assignor to Refurbished Turbine Components Limited, Worcester, England

Filed Jul. 30, 1984, Ser. No. 635,604
Claims priority, application United Kingdom, Aug. 2, 1983, 8320836
Int. Cl.[4] H05B *3/36*
U.S. Cl. 219—200 **15 Claims**



1. A method of repairing an article wherein said method of repair involves the application of considerable thermal energy to said article and wherein said article is heated by flexible heating means comprising:

positioning the flexible heating means on the surface of the article;

releasably holding said flexible heating means on the surface of the article by a plurality of fixing means secured to said article, and spaced from each other to enable holding of said flexible heating means at a plurality of spaced positions, such that at least one of said fixing means may be readily moved to enable that part of the flexible heating means in a repair area on the article to be temporarily removed from said repair area.

4,613,745

ELECTRIC WATER HEATING APPARATUS FOR A DRIP COFFEE MAKER

Vincent G. Marotta, and Ikuo I. Komatsu, both of Shaker Heights, Ohio, assignors to North American Systems, Inc., Bedford Heights, Ohio

Filed Apr. 6, 1984, Ser. No. 597,505
Int. Cl.[4] A47J *31/057, 31/10*; F24H *1/10*; H05B *1/00*
U.S. Cl. 219—297 **14 Claims**

1. An electric automatic water heating apparatus comprising:

a housing having an area containing electrical components,

a reservoir in said housing for receiving and holding water

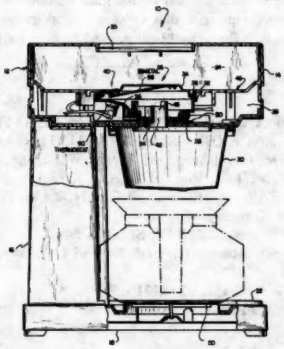
to be heated, said reservoir being composed of a material of low thermal conductivity,

a sealed heating chamber in said housing having a water inlet means in fluid communication with said reservoir for receiving water by gravity and an outlet for discharging heated water for use,

said sealed heating chamber comprising an open tip heating member of high thermal conductivity for receiving and heating water from said reservoir,

a heating element embedded in said high thermally conductive heating member, and

a high thermal conductivity cover member secured to and covering the open top of said heating member and adapted to confine steam generated during heating to said sealed heating chamber,



said cover member being secured to said reservoir,

means for blocking the flow of steam or water from said sealed heating chamber into said housing area containing electrical components,

said cover member having a first surface exposed to any water present in said reservoir and forming a bottom surface portion of said reservoir, said cover member including said water inlet means, and

flow control means including a temperature sensing element for controlling the flow of water from said reservoir through said water inlet means into said sealed heating chamber in response to the sensed temperature in said sealed heating chamber.

4,613,746

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE TEMPERATURE OF A HEATER ELEMENT

Donald N. MacLaughlin, Midland, Mich., assignor to Cosden Technology, Inc., Dallas, Tex.

Continuation of Ser. No. 487,408, Apr. 21, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 742,372

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—490 **6 Claims**

1. A spinwelder device comprising:

(a) a rotating feed element for feeding containers to a sealing station;

(b) an electrical-resistive heater platen for heating a container seal on containers fed to the sealing station; and

(c) means for controlling the temperature of the heater platen comprising:

a production rate sensor associated with said feed element for determing a dewell time of each container on the heater platen;

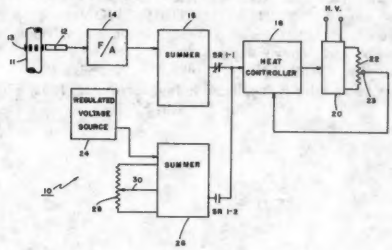
a temperature sensor means for determining the temperature of the heater platen;

an automatic mode circuit means for producing a first output responsive to said production rate sensor;

a standby mode circuit means for producing a second output responsive to said first output;

a heat controller means responsive to said temperature sensor and sid first and second outputs;

a switching means for switching said heat controller into an automatic mode, wherein said heater controller is



responsive to said production rate and said temperature sensor to provide sufficient heat to effect a proper seal of the container seal to the container, and for switching said heat controller into a standby mode, wherein said heat controller is responsive to said temperature sensor and a production rate of the spinwelder upon switching from automatic mode into standby mode to maintain the heater platen above a minimum standby temperature determined by a last previous production rate.

4,613,747

TICKET READING DEVICE

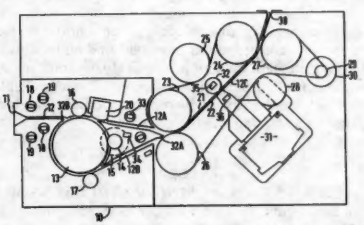
Paul R. McCarthy, Hillingdon, England, assignor to Almex Ticket Machine Company Limited, United Kingdom

Filed Jul. 20, 1984, Ser. No. 632,771

Claims priority, application United Kingdom, Jul. 22, 1983, 8319865

Int. Cl.[4] G06K *13/08*

U.S. Cl. 235—480 **8 Claims**



1. A ticket or card verification and reading device whereby the ticket or card has data only on one side thereof, the device comprising:

a single reading head;

a reversible input roller;

means for driving said input roller a first rotational direction and a second rotational direction which is opposite said first rotational direction;

said input roller moving the ticket or card from an input region of the device to a region further into the device when said driving means drives said input roller in said first rotational direction;

said driving means drives said input roller in said second rotational direction when the ticket or card is inserted into

the device such that the side opposite the data side faces said single reading head; and

said input roller rotating in said second rotational direction moves the ticket or card from said further region to said input region and around said input roller and returning it to said further region thereby turning the ticket or card over.

4,613,748

FOCUS DETECTION APPARATUS EMPLOYING IMAGE HEIGHT CORRECTION

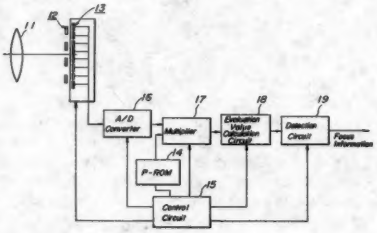
Yuji Imai, Higashiyamato, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,612

Claims priority, application Japan, Nov. 22, 1982, 57-205031

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **7 Claims**



1. An apparatus for detecting a focus condition of an imaging optical system comprising:

a light receiving element array arranged on a predetermined focal plane of the imaging optical system;

pupil dividing means for projecting light flux transmitted through first and second regions of an exit pupil of said imaging optical system to form first and second images on first and second light receiving element groups, respectively, of said light receiving element array;

means for receiving protoelectric output signals supplied from the light receiving element array and for calculating a lateral shift amount between said two images;

means for detecting a focus condition of an image formed by means of said imaging optical system in accordance with said lateral shift amount; and

means for correcting an unbalance in an amount of light of said two images projected onto said first and second light receiving element groups, respectively, by multiplying the photoelectric output signals supplied from the light receiving element array by correction coefficients which are related to a standard image.

4,613,749

PATTERN TRACER USING MATRIX SENSOR

Enn Vali, Burlington, Canada, assignor to Westinghouse Canada Inc., Hamilton, Canada

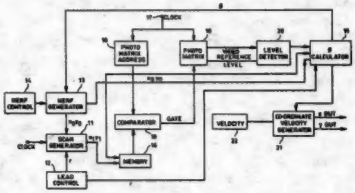
Filed Apr. 9, 1984, Ser. No. 598,438

Claims priority, application Canada, Jun. 1, 1983, 429389

Int. Cl.[4] G05B *1/00*

U.S. Cl. 250—202 **10 Claims**

1. An optical pattern tracer including a photo matrix, means to optically project a portion of said pattern onto said matrix, means to generate a first series of addresses representative of a predetermined closed geometric figure in said matrix, means to interrogate those elements in said matrix located at said addresses, means to generate signals indicative of coincidence of said pattern and interrogated elements, means to derive from said signals a directional signal indicative of the direction of said pattern relative to a reference direction in said matrix, means to generate a velocity signal representative of a desired tangential tracing velocity, means to combine said velocity signal and said directional signal to produce a pair of coordinate velocity signals and means to move said photo matrix in a plane parallel to the plane of said pattern with coordinate



velocities proportional to said coordinate velocity signals and thereby move said matrix at a velocity proportional to said velocity signal in a directional tangential to said pattern.

4,613,750

METHOD OF AND DEVICE FOR CHECKING FOR THE PRESENCE OF A SHEET OF MATERIAL

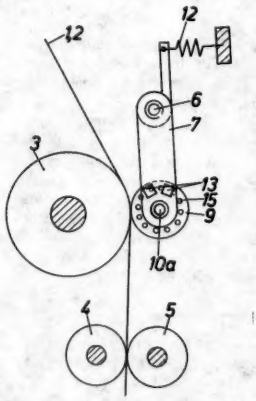
Siegfried Knecht, Gevelsberg, and Jürgen Wiesejahn, Recklinghausen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,227

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3240825

Int. Cl.[4] G01N *9/04*

U.S. Cl. 250—223 R **10 Claims**



1. Apparatus for testing for the presence of sheet material being passed over a feed surface comprising:

a first pick-up roller;

a second pick-up roller;

means supporting said first and second pick-up rollers for independent rotation about a common axis;

means for biasing said supporting means toward the feed surface over which the material is passed;

means for detecting rotation of said second pick-up roller resulting from establishment of contact between said second roller and the sheet material and generating the warning signal commensurate therewith, the sheet material contacting only said first pick-up roller and the feed surface and not contacting said second pick-up roller when properly aligned whereby rotation of said second pick-up

roller is indicative of the absence or misalignment of the sheet material.

4,613,751

CONVEYOR SYSTEM FOR DISC MAGAZINE HAVING AN IDENTIFIER DISC

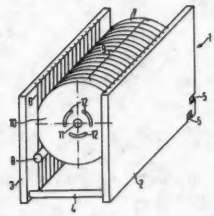
Klaus D. Drechsler, Neustadt; Werner Heuer, Lehrte, and Rainer Tiebel, Schulenburg, all of Fed. Rep. of Germany, assignors to Polygram GmbH, Hamburg, Fed. Rep. of Germany

Filed May 30, 1984, Ser. No. 615,270

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327121

Int. Cl.[4] G06M *7/00*

U.S. Cl. 250—223 R 8 Claims



1. In a conveyor system for mass-production of high packing density disc-shaped information carriers wherein a plurality of disc magazines are provided that can be each moved from work station to work station, wherein the improvement comprises:

the disc magazines being box-shaped and open to receive discs and having parallel side walls with parallel guide grooves at inside surfaces of the side walls for receiving the disc-shaped information carriers as work pieces;

each disc magazine having a stack of workpieces and an identifier disc having a shape corresponding to the workpieces at an initial position within the disc magazine; and

read means at an input side of the work station receiving the disc magazine for interrogation to determine whether the identifier disc is at the initial position of the disc magazine.

4,613,752

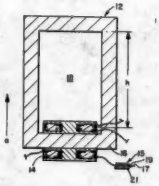
FIBER OPTIC FORCE MEASURING DEVICE

Charles M. Davis, McLean, Va., assignor to Optical Technologies, Inc., Herndon, Va.

Filed Aug. 4, 1983, Ser. No. 520,247

Int. Cl.[4] G01P *15/00*

U.S. Cl. 250—227 23 Claims



1. A force measuring device comprising a substantially hollow three-dimensional container defining interiorly thereof at least one chamber; at least a pair of optical fiber coils; the length of the optical fiber on each of said coils being substantially equal; means mounting said at least one pair of coils on opposite sides of a wall of the hollow container; means within the container normally exerting a force on the coil mounted within the container; an optical interferometer having a pair of legs; means connecting each of said pair of coils in a leg of the interferometer; radiant energy emitting means for directing radiant energy into the legs of the interferometer and through the said pair of coils; and radiant energy detecting means connected to said interferometer.

4,613,753

PHOTOELECTRIC CONVERTING APPARATUS FOR OPTICAL SCANNING SYSTEM

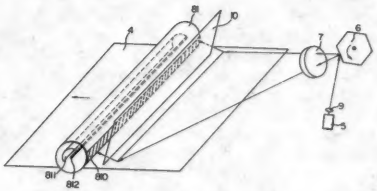
Kunihiro Okada, Tokyo; Hirohide Endo, Tokorozawa, and Susumu Saito, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Company, Ltd., both of Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,378

Claims priority, application Japan, Sep. 24, 1981, 56-149460

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—236 3 Claims



1. A photoelectric converting apparatus comprising a means for generating a spot-like light beam, optical scanning means for focusing said light beam on a scanned surface and moving said beam linearly in a direction perpendicular to the moving direction of said scanned surface, and photoelectric converting means having a photoelectric converting surface with a long piece in the scanning direction, said photoelectric converting surface being made close to said scanned surface, said photoelectric converting means including a light scattering mens inserted between said scanned surface and said photoelectric converting surface to convert the light beam reflected from said scanned surface into scattered light, said scattering means flattening the distribution of light intensity of said reflected light, and said photoelectric converting means being mounted in such a manner as to receive said scattered light reflected from said scanned surface.

4,613,754

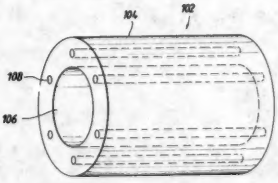
TOMOGRAPHIC CALIBRATION APPARATUS

Harold J. Vinegar, and Scott L. Wellington, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1983, Ser. No. 566,617

Int. Cl.[4] G01D *18/00*

U.S. Cl. 250—252.1 19 Claims



1. An apparatus for providing data for the calibration of the atomic number and density of a test material being scanned in the radiation field of a computerized axial tomographic scanner, said apparatus comprising: a housing adapted to be positioned in said radiation field in a predetermined position and having an aperture adapted to accommodate said test material;

and a plurality of calibration materials having known atomic numbers and densities positioned in said housing.

4,613,755

METHOD OF MASS SPECTROMETRY

Jeffrey W. Hudgens, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1983, Ser. No. 506,090
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 14 Claims

1. A method of producing ions of a target gas, BC, in a mixture of gases, the steps of which comprise:

selecting a reagent ion X^+ so that the electron affinity of X^+ is less than the ionization potential of any of the gases in said mixture, including BC;

selectively inducing an electronic transition of BC to an excited electronic state to produce BC^* so that the ionization potential of BC^* is less than the electron affinity of X^+;

colliding X^+ with BC^* to produce BC^+ in accordance with the charge-exchange reaction:

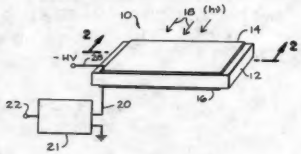
$$X^+ + BC^* \rightarrow X + BC^+.$$

4,613,756

MERCURIC IODIDE LIGHT DETECTOR AND RELATED METHOD

Jan S. Iwanczyk; Jeff B. Barton, both of Los Angeles; Andrzej J. Dabrowski, Culver City, and Wayne F. Schnepple, Santa Barbara, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Jun. 7, 1982, Ser. No. 385,420
Int. Cl.[4] G01T *1/24*
U.S. Cl. 250—361 R 15 Claims



1. Apparatus for detecting radiation comprising:

a scintillator;

a body of mercuric iodide defining a first surface for exposure to light and a second surface spaced from the first surface;

means for optically coupling the scintillator to the first surface;

means for producing an electrical potential difference between the first and second surfaces; and

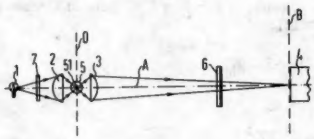
means for measuring current passed through the body of mercuric iodide in response to light produced within the scintillator.

4,613,757

METHOD FOR VISUALIZING A DOPED STRUCTURE IN UNDOPED ENVIRONMENT

Ulrich Deserno, Munich, and Günther Schmidt, Freising, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,781
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335129
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—458.1 9 Claims



1. A method for making the doped core of a monomode fiber having a longitudinal axis visible, said method comprising the steps of:

(A) generating with invisible light and a microscope objective lens means a microscope image of said doped core, said image being projected along a beam path having an optical axis which intersects said fiber longitudinal axis, said invisible light being characterized by having a wavelength range in which the spectral adsorption of the doped core differs noticeably from the spectral absorption of the undoped environment,

(B) positioning a plano-convex cylindrical lens having a longitudinal axis in said beam path so that said lens longitudinal axis perpendicularly intersects said optical axis and extends perpendicularly to said fiber longitudinal axis, and

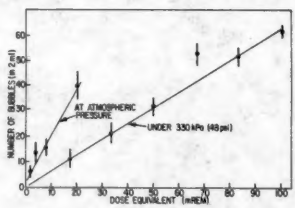
(C) evaluating such microscope image through said lens.

4,613,758

DIRECT READING DETECTOR/DOSIMETER FOR NEUTRONS AND OTHER HIGH LET RADIATION

Harry Ing, Deep River, and Hyman C. Birnboim, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 6, 1984, Ser. No. 638,308
Claims priority, application Canada, Aug. 26, 1983, 435413
Int. Cl.[4] G01T *1/02, 3/00*
U.S. Cl. 250—474.1 14 Claims



1. A direct reading detector/dosimeter for neutrons and other high LET radiation comprising:

(a) an elastic substantially transparent or translucent solid medium, and

(b) discrete droplets of a superheated detector liquid insoluble in, and substantially homogeneously dispersed in, said solid medium;

said solid medium being selected to immobilize the product of vaporization of each droplet and suffering substantially permanent detectable damage or deformation at each droplet site due

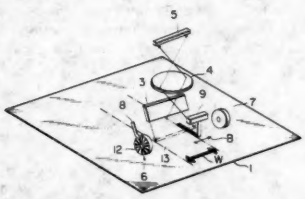
to said vaporization, said damage or deformation giving a lasting measure of the radiation dose.

4,613,759

SMALL PHOTOELECTRIC READING APPARATUS

Hugh F. Frohbach, Sunnyvale, Calif., assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,699
Int. Cl.[4] G06K 7/10
U.S. Cl. 250—566 5 Claims



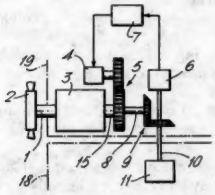
1. An apparatus for optically detecting an object, including:
(a) an optical system for imaging said object on a predetermined surface;
(b) photoelectric converting means including a linear image sensor having a band-like light-receiving surface extending in one direction, said light-receiving surface being disposed so as to be substantially coincident with said predetermined surface, said linear image sensor producing an output signal corresponding to the intensity distribution of light on said light-receiving surface;
(c) index mark means for forming a predetermined image on said light-receiving surface;
(d) displacing means for imparting relative displacement between a detected area extending in one direction of said object conjugate with said light-receiving surface through said optical system and said object in a direction substantially orthogonal to the direction in which said detected area extends;
(e) means for detecting the position of said predetermined image on said light-receiving surface on the basis of the output signal from said linear image sensor and producing a detection signal prior to the displacement being imparted between said detected area and said object;
(f) means for setting an arbitrary area on said light-receiving surface on the basis of said detection signal; and
(g) means for reading the output signal from said linear image sensor in response to the displacement between said detected area and said object, said means reading a part of the output signal from said linear image sensor which corresponds to said set arbitrary area.

4,613,760

POWER GENERATING EQUIPMENT

Hilton Law, Leicestershire, England, assignor to The English Electric Company Limited, England

Filed Sep. 12, 1984, Ser. No. 649,828
Int. Cl.[4] F16H 5/52; H02K 7/116
U.S. Cl. 290—1 C 14 Claims



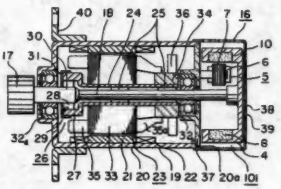
1. An alternating current electrical power generating system of the kind in which an electrical generator is driven by a turbine whose torque can vary, comprising a differential drive unit having an output shaft coupled to the generator, a first input coupled to the turbine and a second input coupled to a reaction machine, the latter controlling the torque on said second input in response to changes in the first input in a sense which tends to compensate for turbine torque variations and thereby reduce fluctuations of torque on the generator.

4,613,761

STARTER DYNAMO

Kiyoshi Yabunaka, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,155
Claims priority, application Japan, Oct. 18, 1983, 58-162254[U]
Int. Cl.[4] F02N 11/04
U.S. Cl. 290—36 R 1 Claim



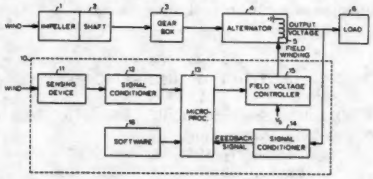
1. A starter dynamo comprising:
a rotatable output shaft having an enlarged diameter portion at one end thereof and a reduced diameter portion along the remainder thereof;
rotational power transmission means at said one end of said shaft;
a D.C. motor having an armature mounted on a hollow armature rotary shaft mounted coaxially around said output shaft, with said armature mounted coaxially around said reduced diameter portion of said output shaft;
one way clutch means for rotatably connecting said hollow shaft to said enlarged diameter portion of said output shaft in one rotational direction; and
a generator provided with a flywheel magnet fixed to another end of said output shaft and axially spaced from said D.C. motor,
whereby the diameter of said D.C. motor is reduced.

4,613,762

OUTPUT RESPONSIVE FIELD CONTROL FOR WIND-DRIVEN ALTERNATORS AND GENERATORS

Leo H. Soderholm, Ames, Iowa, assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 11, 1984, Ser. No. 680,615
Int. Cl.[4] F03D 9/00; H02P 9/14
U.S. Cl. 290—44 7 Claims



1. A control device for operating a wind machine at maximum efficiency by maintaining a maximum output voltage for

the machine as a function of the power in the wind, wherein said wind machine comprises a generator for converting said energy to electricity, the apparatus comprising:

a. a field control for controlling the field voltage applied to the generator field winding;

b. means for generating a feedback signal representing the output voltage of said generator at periodic intervals;

c. means for comparing successive feedback signals to one another;

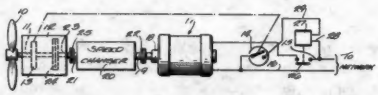
d. means responsive to said comparing means for generating a signal to said field control for adjusting said field voltage by increments or decrements, whereby the direction of adjustment is in the same direction as the previous adjustment if said previous adjustment resulted in an increase in output voltage, and it is in the direction opposite to the previous adjustment if said previous adjustment resulted in a decrease in output voltage.

4,613,763

WIND DRIVEN ELECTRIC POWER GENERATING SYSTEM

Theodore L. Swansen, 4424 Pleasant Lake Rd., East Troy, Wis. 53120

Filed Dec. 24, 1984, Ser. No. 686,092
Int. Cl.[4] F03D *9/00*; H02P *9/04*
U.S. Cl. 290—44 **5 Claims**



5. An electrical generating system comprising:

generator means operative alternately in a power generating mode at a predetermined high speed and a motor mode at a predetermined lower speed and having a rotor shaft,

switch control means and a circuit including a switch controlled by said control means to selectively connect and disconnect said generator means to and from an electric power system,

speed changer means having first and second shafts said second shaft being coupled to said generator rotor shaft and said first shaft coupled to a drive assembly output shaft,

a drive assembly including an input and an output shaft and clutch means engagable at said predetermined high speed, said output shaft being coupled to said speed changer first shaft when said clutch is engaged at said predetermined high speed,

said switch control means responding to said input shaft attaining said predetermined low speed by closing said switch to thereby connect said generator means to said electric power system for drawing power from said system to operate said generator means in said motor mode for driving said speed changing means up to a speed corresponding to said predetermined high speed prior to engagement of said clutch means and said generator means converting to said power generating mode when said generator means attains said predetermined high speed and said clutch means is engaged with input power from said drive assembly.

4,613,764

RAIN DETECTOR FOR IRRIGATION CONTROL SYSTEM

Toribio Q. Lobato, San Dimas, Calif., assignor to Clemar Manufacturing Corp., Azusa, Calif.

Filed Sep. 19, 1984, Ser. No. 652,179
Int. Cl.[4] H01H *35/18*; F24F *11/00*
U.S. Cl. 307—116 **21 Claims**

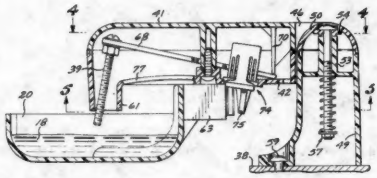
1. A rain detector responsive to rainfall for preventing operation of an irrigation system having a controller for electrically operating at least one sprinkler valve, said rain detector comprising:

a detector housing;

a switching circuit disposed generally within said housing and including means for electrical connection in series with the controller and at least one sprinkler valve, said switching circuit further including a pair of conductive sensors protruding in spaced relation from said housing;

a support plate movably mounted within said housing and carrying said sensors;

a rainwater collection tray supported from said housing in a substantially upwardly open position exposed to rainfall, said sensors protruding from said housing downwardly at least partially into said collection tray; and



means accessable from the exterior of said housing for movably positioning said support plate for adjustably selecting the depth of protrusion of said sensors into said tray for bridging of said sensors by an adjustably selected amount of rainfall collected within said tray;

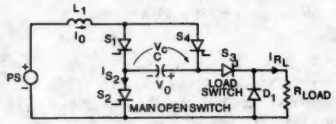
said switching circuit including means for providing a normal closed circuit condition between the controller and at least one sprinkler valve when the level of water within said tray in insufficient to bridge said sensors and for providing an effective open circuit condition between the controller and at least one sprinkler valve when the level of water within said tray is insufficient to bridge said sensors.

4,613,765

SERIES-COUNTERPULSE REPETITIVE-PULSE INDUCTIVE STORAGE CIRCUIT

Emanuel M. Honig, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,658
Int. Cl.[4] H03K *17/72, 3/352*
U.S. Cl. 307—252 K **6 Claims**



1. A series-counterpulse repetitive-pulse inductive storage circuit comprising:

a. a dc voltage source having a positive and a negative output;

b. a load having a first and a second end, said first end thereof connected to said negative output of said dc voltage source;

c. a storage coil having a first and a second end, said first end thereof connected to said positive output of said dc voltage source;

d. a counterpulse capacitor having a first and a second end, said counterpulse capacitor initially forward charged to a final voltage;

e. first unidirectional triggerable means connected between

said second end of said storage coil and said first end of said counterpulse capacitor, said first unidirectional triggerable means for closing when said counterpulse capacitor is fully forward charged and for being counterpulsed off when the voltage on said counterpulse capacitor becomes reversed charged;

f. second unidirectional triggerable means connected between said first end of said counterpulse capacitor and said first end of said load, said second unidirectional triggerable means for initially being closed and for being counterpulsed off when current flowing through said load is equal to current flowing through said storage coil and for being triggered reclosed to terminate current flowing through said load;

g. third unidirectional triggerable means connected between said second end of said counterpulse capacitor and said second end of said load, said third unidirectional triggerable means for being triggered closed to initiate a current flow from said counterpulse capacitor through said second unidirectional triggerable means and said load, and for being counterpulsed off when said counterpulse capacitor is reversed charged, and said second unidirectional triggerable means is triggered reclosed; and

h. fourth unidirectional triggerable means connected between said second end of said storage coil and said second end of said counterpulse capacitor, said fourth unidirectional triggerable means for closing when said counterpulse capacitor becomes reversed charged and for being counterpulsed off when said first unidirectional triggerable means is closed when said counterpulse capacitor is fully forward charged.

4,613,766
THYRISTOR HAVING CONTROLLABLE EMITTER SHORT CIRCUITS

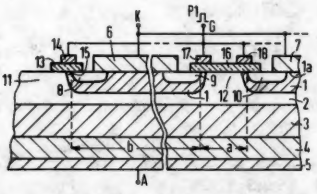
Hubert Patalong, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 22, 1980, Ser. No. 199,633

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945366

Int. Cl.⁴ H03K *17/60*

U.S. Cl. 307—252 A **6 Claims**



1. A method of operating a thyristor structure of the type in which a semiconductor body includes first and second base layers adjacent and contacting one another, an n-emitter layer contacting the first base layer, a first electrode contacting the n-emitter layer, a p-emitter layer contacting the second base layer, a second electrode contacting the p-emitter layer, and controllable metal-insulator- semiconductor emitter short circuit structures located at at least one boundary surface of the semiconductor body, each of the short circuit structures including a p semiconductor region of the first conductivity type contacting the first electrode, a second semiconductor region of the p conductivity type contacting the adjacent base layer, an intermediate third semiconductor region of the n, opposite conductivity type between said first and second regions adjacent the boundary surface, and an insulated gate carried over the intermediate third region, in which the emitter layer associated with the metal-insulator-semiconductor structures is divided into a plurality of emitter zones including edges, (*) said emitter zones being respectively provided with portions of the electrode contacting said emitter layer, said portions being conductively connected with one another, the metal-insulator-semiconductor structures, including the insulated gates, are located at the emitter zone edges, and a common terminal is connected to the gates for receiving a voltage pulse to neutralize the emitter short circuits, comprising the steps of:

applying a voltage pulse to the common terminal of a polarity which causes a transfer of the thyristor from the blocked state into the conducting state for depletion type metal-insulator-semiconductor structures.

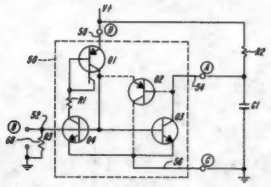
4,613,767
LOW FORWARD-VOLTAGE DROP SCR

Varnum S. Holland, Amherst, N.H., assignor to Unitrode Corporation, Lexington, Mass.

Filed Oct. 31, 1983, Ser. No. 546,983

Int. Cl.⁴ H03K *17/72, 3/26*

U.S. Cl. 307—288 **7 Claims**



1. A low forward voltage drop SCR, comprising:

a latch having an on and an off state providing a latch output signal when in the on state;

an output transistor operable in response to said latch output signal and including a saturated condition; and

means to turn off said latch when said output transistor is saturated, wherein

said output transistor is one of an NPN and a PNP transistor, and

said means to turn off said latch comprises a second transistor complementary to said output transistor, wherein

said second transistor provides a current flow to turn off said latch when said output transistor is saturated.

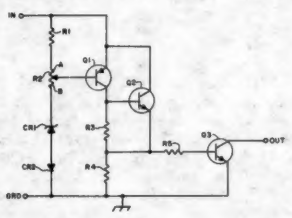
4,613,768
TEMPERATURE DEPENDENT, VOLTAGE REFERENCE COMPARATOR/DIODE

Karl E. Pommer, II, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Nov. 13, 1984, Ser. No. 670,508

Int. Cl.⁴ H03K *5/153*

U.S. Cl. 307—350 **9 Claims**



1. A combined temperature dependent voltage reference and voltage comparator circuit comprising: an input; a current source comprising the base-emitter diode of a first transistor,

and adjustable resistance means connected between said input and said first transistor base; voltage reference means comprising a temperature dependent voltage reference including first and second oppositely poled unidirectional conducting means connected to said first transistor base by means of a variable resistance; a differential voltage detector including a portion of said current source; output means; and current amplifier means connected between said voltage detector and said output means; said circuit operated in response to a voltage applied to said input being equal to a predetermined threshold voltage, to cause said detector to initiate the conduction of current through said output means.

4,613,769

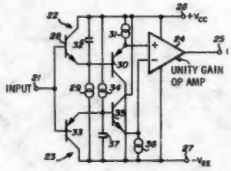
DIRECT CURRENT COUPLED PEAK TO PEAK DETECTOR CIRCUIT

William H. Gross, Sunnyvale, Calif., and Toyojiro Naokawa, Saitama, Japan, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 13, 1984, Ser. No. 639,880

Int. Cl.[4] H03K *5/153;* **G01R** *19/04*

U.S. Cl. 307—351 **3 Claims**



1. A direct current coupled peak-to-peak detector circuit having an input terminal connectable to a source of signal to be detected and a direct current output related to the peak-to-peak value of the input signal a-c component, said circuit comprising:

a positive peak detector comprising a first emitter follower driven from said source of signal to be detected and having a filtering capacitor coupled thereto to form a peak detector and a second emitter follower complementary to said first emitter follower and having an input driven therefrom, said second emitter follower having an output whereby any offset in said first emitter follower is substantially cancelled;

a negative peak detector comprising a first emitter follower driven from said source of signal to be detected and having a filtering capacitor coupled thereto to form a peak detector and a second emitter follower complementary to said first emitter follower and having an input driven therefrom, said second emitter follower having an output whereby any offset in said first emitter follower is substantially cancelled; and

an operational amplifier having differential inputs and a single ended output for subtractively combining the outputs of said positive peak detector and said negative peak detector.

4,613,770

VOLTAGE MONITORING CIRCUIT

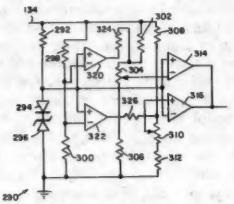
Herman P. Raab, Indianapolis, Ind., assignor to Consolidated Investments and Development Corp., Carmel, Ind.

Division of Ser. No. 458,447, Jan. 17, 1983, Pat. No. 4,503,431, which is a continuation-in-part of Ser. No. 191,840, Sep. 29, 1980, abandoned. This application Dec. 4, 1984, Ser. No. 678,024

Int. Cl.[4] H03K *5/153;* **G01R** *19/165, 19/175*

U.S. Cl. 307—350 **8 Claims**

1. A system for determining whether a direct current voltage across a pair of terminals is within an acceptable lower absolute magnitude range, or within an acceptable higher absolute magnitude range, or in a forbidden zone outside either of these ranges, comprising means for scaling down the voltage across the terminals to provide a first voltage related in magnitude to the voltage across the terminals, means for establishing a reference direct current voltage, means for comparing the first related voltage to the reference voltage and for switching in response to comparison outcome, the comparing and switching means having a first state when the first related voltage corresponds to a voltage across the terminals which is within the acceptable lower absolute magnitude range, and second means for comparing a second voltage related in magnitude to the voltage across the terminals to the reference voltage to



determine whether the voltage across the terminals is greater than the highest acceptable magnitude of the lower magnitude range by a predetermined amount and for switching in response to such comparison outcome, the second comparing means having a first state when the voltage across the terminals does not exceed the highest acceptable limit of the lower magnitude range by the predetermined amount and a second state when the voltage across the terminals exceeds the highest acceptable limit of the lower magnitude range by the predetermined amount, the second comparing means, when in its second state, scaling down the first related voltage.

4,613,771

INTEGRATED CIRCUIT HAVING THREE POWER BASES AND PROPORTIONED PARASITIC RESISTIVE AND CAPACITIVE COUPLING TO REDUCE OUTPUT NOISE

Laszlo V. Gal, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 18, 1984, Ser. No. 601,532

Int. Cl.[4] H03K *19/003, 19/086, 19/094, 19/20*

U.S. Cl. 307—443 **11 Claims**

1. A circuit integrated into a substrate and having improved noise immunity, comprising:

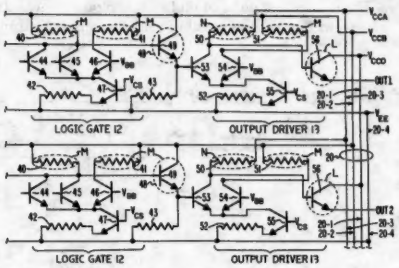
a plurality of intercoupled logic gate means that receive input signals, switch currents internally in each gate to perform respective logic functions on their input signals, and produce logic signals with voltage states that indicate the results of the logic functions;

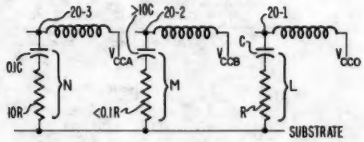
a plurality of output driver means, each of which is coupled to receive at least one of said logic signals; each of said output driver means including a resistor means for passing a small bias current indicating said voltage states of said received logic signals, and a transistor means coupled to said resistor means for passign a large drive current when said bias current indicates said received logic signals are in a particular state;

said logic gate means, resistor means, and transistor means being parasitically coupled together via respective parasitic capacitances and resistances through said substrate; and

a first power bus means coupled to said transistor means for supplying said drive current thereto, a second power bus means separate from said first power bus means and coupled to said logic gate means for supplying said currents

that switch internally thereto, and a third power bus means separate from said first and second power bus





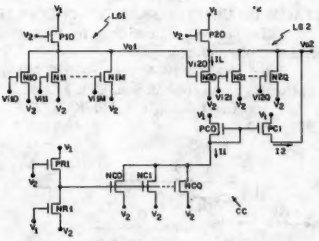
means and coupled to said resistor means for supplying said bias current thereto.

4,613,772

CURRENT COMPENSATION FOR LOGIC GATES

W. Ronald Young, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 11, 1984, Ser. No. 598,985
Int. Cl.⁴ H03K *19/003, 19/094, 19/20*
U.S. Cl. 307—443 **34 Claims**



1. A logic circuit comprising:

a first logic gate means comprising a plurality of inputs requiring all the inputs to have the same first input logic state for the output to switch from a first to a second output logic state;

a second logic gate means having a plurality of input devices responsive to respective inputs and requiring each of their respective inputs to have the same second input logic state for the output to switch from a third to a fourth output logic state;

said output of said first logic gate means being connected to one of the inputs of said second logic means and said first output logic state representing said second input logic state;

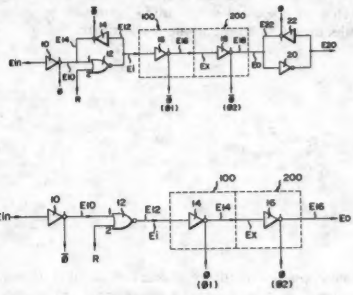
current means connected to said second logic gate means output for determining leakage current created by one of said first logic gate's input having a first input logic state which produces an output sufficient to create a leakage current at said second logic gate means output and providing a compensating current responsive to the determined leakage current and being sufficient to compensate for said leakage current.

4,613,773

RACEFREE CMOS CLOCKED LOGIC CIRCUIT

Hideharu Koike, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 23, 1984, Ser. No. 572,756
Claims priority, application Japan, Jan. 29, 1983, 58-13506
Int. Cl.⁴ H03K *19/096, 23/44, 3/037;* **G11C** *19/28*
U.S. Cl. 307—443 **6 Claims**



1. A racefree CMOS clocked logic circuit comprising: first clocked circuit means including means for providing an input signal and being responsive to said input signal and to a first clock pulse, for selectively transferring said input signal according to said first clock pulse, to provide an interstage signal corresponding to said input signal, said first clocked circuit means including:

a first CMOS clocked gate responsive to said input signal and being clocked by a clock pulse corresponding to said first clock pulse for providing said interstage signal,

a second CMOS clocked gate being responsive to a first signal and to an inverted clock pulse, said inverted clock pulse being antiphasic to said first clock pulse for selectively and phase-invertedly transferring said first signal according to said inverted clock pulse to provide a second signal,

a CMOS logic gate coupled to said second CMOS clocked gate for selectively transferring said second signal to provide said input signal; and

second clocked circuit means coupled to said first clocked circuit means and being responsive to said interstage signal and to a second clock pulse for selectively transferring said interstage signal according to said second clock pulse to provide an output signal corresponding to said interstage signal, said second clock pulse being in-phase with said first clock pulse, said second clocked circuit means including:

a third CMOS clocked gate responsive to said interstage signal and being clocked by a clock pulse corresponding to said second clock pulse for providing said output signal.

4,613,774

UNITARY MULTIPLEXER-DECODER CIRCUIT

Nikhil C. Mazumder, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 9, 1984, Ser. No. 629,032
Int. Cl.⁴ H03K *19/013, 19/086, 19/20;* **G05F** *3/22*
U.S. Cl. 307—463 **19 Claims**

1. A unitary multiplexer-decoder circuit integrated on a single semiconductor chip comprising:

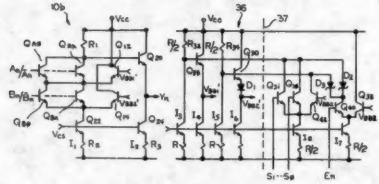
a first reference transistor having its collector connected to

a supply potential and its base connected to a first reference potential;

a plurality of the first data input transistors having all of its collectors commonly coupled together, all of its emitters commonly coupled together and its bases being connected to a first set of input terminals, said common collectors of said first input transistors being connected to said supply potential through a load resistor, said common emitters of said first input transistors being connected to the emitter of said first reference transistor;

a second reference transistor having its collector connected to the collector of said first reference transistor and its base connected to a second reference potential;

a plurality of second data input transistors having all of its collectors commonly connected together, all of its emitters commonly coupled together and its bases being connected to a second set of input terminals, said common collectors of said second input transistors being connected



to said common emitters of said first input transistors, said common emitters of said second input transistors being connected to the emitter of said second reference transistor;

an emitter follower transistor having its collector connected to said supply potential, its base connected to the common collectors of said first input transistors and its emitter connected to an output terminal;

a first current source connected to the emitter of said second reference transistor;

a second current source connected to the emitter of said emitter follower transistor;

a reference voltage generator for generating said first and said second reference potentials, said reference generator being formed on the same integrated circuit substrate as the multiplexer-decoder circuit; and

said reference generator including an enable transistor for turning off said first and second reference transistors.

4,613,775

APPARATUS OR METHOD FOR STABILIZING THE FREQUENCY OF A CLOCK SIGNAL GENERATED FROM AN ON-CHIP CLOCK GENERATOR

Carroll J. Dick, Dryden, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1984, Ser. No. 618,798

Int. Cl.[4] H03K *19/00*; H03L *7/00*

U.S. Cl. 307—480 **5 Claims**

5. A method of stabilizing the frequency of a clock signal generated from a clock signal generator, comprising the steps of:

generating a first pulse of a system clock;

propagating said first pulse of said system clock through a delay line of said clock signal generator;

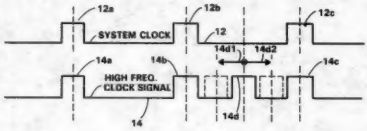
during the propagation of said first pulse of said system clock through said delay line, receiving said first pulse of said system clock independently of said delay line and generating a first pulse of said clock signal in response thereto;

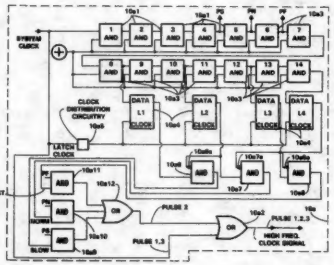
generating a second pulse of said system clock;

propagating said second pulse of said system clock through said delay line of said clock signal generator;

during the propagation of said second pulse of said system clock through said delay line, receiving said second pulse of said system clock independently of said delay line and generating a second pulse of said clock signal in response thereto; and

receiving said first pulse of said system clock from said delay line and said second pulse of said system clock from said





delay line and generating a third pulse of said clock signal in response thereto, said third pulse of said clock signal being positioned approximately mid-way between said second pulse of said clock signal and a fourth pulse of said clock signal.

4,613,776

VOLTAGE TO CURRENT CONVERSION CIRCUIT

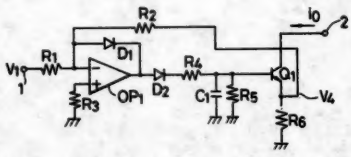
Satoshi Ishii, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,930

Claims priority, application Japan, Oct. 14, 1983, 58-192251

Int. Cl.[4] G06G *7/18*; H03K *7/12*

U.S. Cl. 307—490 **5 Claims**



1. A current conversion circuit comprising:

an operational amplifier, a diode and a time constant circuit cascade connected, an input signal being applied to an inverting input terminal of said operational amplifier;

a transistor the base of which is connected to the output terminal of said time constant circuit and the collector of which is connected to an output terminal; and

an impedance element connected between said inverting input terminal of said operational amplifier and the emitter of said transistor,

a conversion current being obtained at said output terminal.

4,613,777

BINARY SIGNAL COMPARATOR USING TWO D FLIP-FLOPS FOR PRECISE TRIGGERING

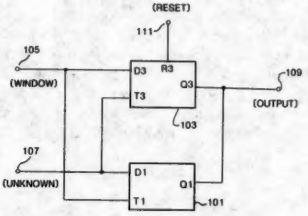
Dieter Kible, Gartringen, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 20, 1984, Ser. No. 684,996

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346942

Int. Cl.[4] H03K *17/13*

U.S. Cl. 307—591 18 Claims



1. A detector circuit for detecting a state change of an unknown binary signal during a time window, comprising:

first sample means, having a data input for receiving the unknown signal and a trigger input for receiving a window signal indicative of the time window, for presenting at an output the state of the unknown signal at the start of the time window;

second sample means, having a data input for receiving the window signal and a trigger input for receiving the unknown signal, for presenting at an output the state of the window signal at the state change of the unknown signal; and

logic means, coupled to the outputs of the first and second sample means, for presenting at an output the logical OR combination thereof.

4,613,778

ELECTRIC MOTORS

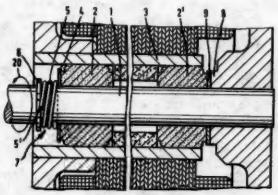
Günter Wrobel, Villingen, and Ulrich Koletzki, St. Georgen, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 367,894, Apr. 13, 1982, abandoned. This application Aug. 24, 1984, Ser. No. 644,142

Claims priority, application Switzerland, Apr. 14, 1981, 2463/81

Int. Cl.[4] H02K *5/16*

U.S. Cl. 310—90 15 Claims



1. In a small electric motor having a stator, a rotor, a shaft, a bearing tube, and a pair of sleeve bearing means having end faces and journalling the shaft and being mounted within the bearing tube in axially spaced relationship, the end faces facing each other being the inner faces and the other end faces being the outer faces, a construction for the reduction of axial rotor oscillations comprising a sliding surface surrounding a portion of the motor shaft and lying in a plane transversely of the shaft adjacent an outer end face of one of the sleeve bearing means; means causing relative sliding movements between only said sliding surface and the outer face of said one of the sleeve bearing means during rotation of the rotor, said means causing relative sliding movements surrounding a portion of the shaft adjacent the outer face of said one of the sleeve bearing means and being surrounded by a portion of the bearing tube; and means softy urging said sliding surface into sliding contact with the outer face of said one of the sleeve bearing means, said softly urging means surrounding a portion of the shaft while extending axially thereof adjacent the outer face of said one of the sleeve bearing means and being surrounded by a portion of the bearing tube.

4,613,779

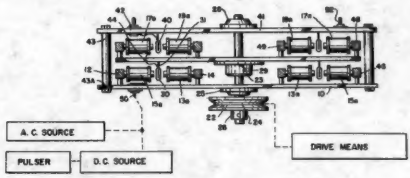
ELECTRICAL PULSE GENERATOR

Stanley A. Meyer, 3792 Broadway, Grove City, Ohio 43213

Filed Jul. 29, 1983, Ser. No. 518,534

Int. Cl.[4] H02K *16/00*

U.S. Cl. 310—112 20 Claims



1. An electrical generator comprising:

a base member,

a first series of electromagnets positioned thereon,

a second series of electromagnets positioned on said base member in a face-to-face relationship woth said first series,

each of said first series of electromagnets and its second series complimentary magnets having opposite polarity, and means to energize said first and second series of electromagnets to create a magnetic field therebetween,

a non-magnetic ring having windings wound thereon,

said ring positioned between said first and second series of electromagnets on a second base member;

means for imparting a relative motion between said electromagnets and said ring comprising a rotatable shaft extending through said first base member and connected to said second base member;

said motion causing said ring/winding to traverse said magnetic fields between said electromagnets, thereby inducing a voltage/current in said windings; and

a pair of terminals on said winding, and

means connected to said winding terminals for utilization of said induced voltage/current.

4,613,780

LANCED STRIP AND EDGEWISE WOUND CORE

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 12, 1984, Ser. No. 660,211

Int. Cl.[4] H02K *1/00*

U.S. Cl. 310—216 24 Claims

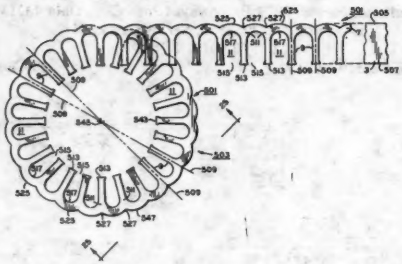
1. A lanced strip of generally thin ferromagnetic material adapted to be edgewise wound into a core for a dynamoelectric machine comprising:

a continuous yoke section on said lanced strip and extending generally longitudinally thereof;

a plurality of teeth on said lanced strip aligned about a plurality of equally spaced apart pitch axes therefor and extending generally laterally from said yoke section, respectively, and said teeth including a plurality of root portions integral with said yoke section, and a plurality of tips opposite said root sections and equally spaced therefrom, respectively;

a plurality of slots in said lanced strip and disposed between adjacent ones of said teeth, said slots including a plurality of open ends extending generally between said tips of said adjacent ones of said teeth, respectively; and

said yoke section including a plurality of arcuate inner edges, each arcuate inner edge being defined by a first radius having a center point on a central axis spaced equidistantly between the pitch axes of said adjacent ones of said teeth and with said each arcuate inner edge extending between said root portions of said adjacent ones of said teeth thereby to define a closed end of respective ones of said slots generally opposite said open end thereof, and a plurality of arcuate outer edges with adja-



cent ones of said arcuate outer edges intersecting with each other at the pitch axes of said teeth, respectively, each arcuate outer edge being defined by a second radius predeterminately greater than first radius and having the same center point as the first radius, and a plurality of generally uniform arcuate segments on said yoke section disposed between said arcuate outer edges and a part of said arcuate inner edges, respectively, the arcuate length of each uniform arcuate segment being defind by a pair of imaginary planes extending between the center point on the central axis between the pitch axes of said adjacent ones of said teeth and the intersections of one of said arcuate outer edges with an adjacent pair of said arcuate outer edges.

4,613,781

END CAP ASSEMBLY AND BRUSH BOX AN ELECTRIC MOTOR

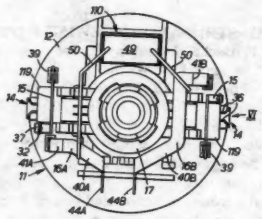
Anthony J. Sanders, Darlington, England, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 7, 1984, Ser. No. 648,534

Claims priority, application United Kingdom, Sep. 9, 1983, 8324263; Jun. 22, 1984, 8415951

Int. Cl.[4] H02K *15/00, 13/10*

U.S. Cl. 310—239 **11 Claims**



4. An end cap assembly for mounting on a lamination stack of an electric motor having a motor axis, said end cap assembly comprising:

a plastics body, a pair of brush boxes made of electrically conducting material, mounted on the plastics body and housing brushes resiliently biased in a direction towards the motor axis for making contact with a rotor of the motor;

the brush boxes including releasable fastenings for retaining the brushes in a retracted position in the brush boxes;

a plurality of electrical conductors in the form of strips of predetermined configuration located in the plastics body for making electrical connections between components of the motor, each of the brush boxes making contact with a respective electrical conductor; and

each brush box being made of sheet material and including side walls, an end wall, and an opening opposite the end wall and the end wall being connected to one of the side walls by a tongue of sheet material and being movable from a closed position in which it obstructs the associated end of the brush box to an open position in which the obstruction is substantially removed to enable a brush to be inserted or removed, movement of the end wall being accompanied by deformation of the tongue.

4,613,782

ACTUATOR

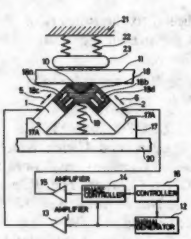
Kenji Mori, Tsuchiura, and Toshio Ogiso, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,851

Claims priority, application Japan, Mar. 23, 1984, 59-54282; Jan. 21, 1985, 60-7523

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **8 Claims**



1. An actuator to drive a driven member, comprising:

a base;

a first driving member fixed to said base and having one vibrating direction;

a second driving member having one vibrating direction and fixed to said based in such a fashion that the vibrating direction thereof crosses that of said first driving member;

a resultant motion mechanism coupled to said first and second driving members and generating resultant vibration having circular orbit by combining their unidirectional vibrations with each other;

a driving element disposed at the vibrating end of said resultant motion mechanism and transmitting the resultant displacement to said driven member;

means for supplying excitation force to said first and second driving member; and

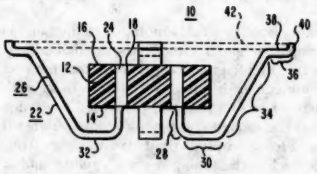
wherein said first and second driving members consist of piezo-electric devices and wherein said resultant motion mechanism is equipped with a connecting member connecting said driving element to said first and second driving members, and said connecting member is equipped with a slit extending in the vibrating direction of each of said driving members.

4,613,783

ELECTRONIC OSCILLATOR CRYSTAL WAFER MOUNT ASSEMBLY

Hazen Curtis, III, Andover, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 18, 1985, Ser. No. 756,331
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—353 11 Claims



1. A mounting assembly for an electronic oscillator crystal, comprising:

a mounting block of electrically insulating material having a bottom face, a top face, and an edge, said block being provided with at least two receiving apertures extending into its bulk from its bottom face;

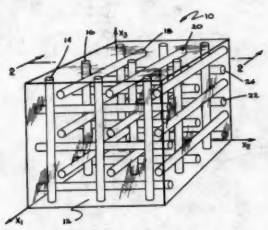
a plurality of conductive terminals, each comprising a shank segment which is inserted and firmly held in one of said apertures, and a resilient supporting finger which extends from said shank at said bottom face around said outer edge to said top face and is adapted at its end to support the perimeter area of a wafer crystal in a position closely adjacent said top face of said block.

4,613,784

TRANSVERSELY REINFORCED PIEZOELECTRIC COMPOSITES

Michael J. Haun; Robert E. Newnham, both of State College, Pa., and Walter A. Schulze, Alfred Station, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 21, 1984, Ser. No. 684,529
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—358 10 Claims



1. A PZT-glass-polymer composite material of 1-2-3 connectivity which comprises:

a matrix of a polymer;

a plurality of generally parallel PZT-rods aligned in the direction of a poling electric field secured in said matrix of the polymer;

means for electrically poling said plurality of PZT-rods in said matrix of the polymer;

a first plurality of glass-fibers aligned in a direction perpendicular to said plurality of PZT-rods; and

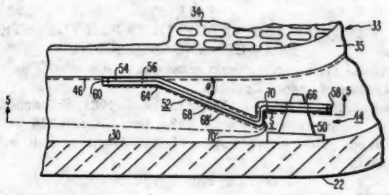
a second plurality of glass-fibers aligned in a direction perpendicular both to the direction of said plurality of PZT-rods and to the direction of said first plurality of glass fibers.

4,613,785

COLOR PICTURE TUBE HAVING AN IMPROVED SIMPLIFIED SUPPORT STRUCTURE FOR A COLOR SELECTION ELECTRODE

Frank R. Ragland, Jr., Manheim Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,850
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—405 4 Claims



1. In a color picture tube of the type including an evacuated envelope enclosing a substantially rectangular cathodoluminescent screen, a color selection electrode suspended in register with said screen by support means and an electron gun, said support means comprising a plurality of studs attached to said envelope adjacent to the corners of said screen and a plurality of springs connecting said color selection electrode to said studs, the improvement comprising

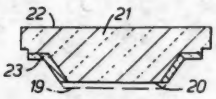
each of said springs being a bimetal member of laminated construction having two layers of dissimilar metal joined along facing surfaces, each of said springs having a proximal end attached at an angle to said color selection electrode and a distal end with an aperture therein pivotably engaging one of said studs, each of said springs including a step-like portion formed therein adjacent to said distal end, said springs providing longitudinal and rotational compensation thereby maintaining said color selection electrode in register with said screen when said color selection electrode and said springs are heated.

4,613,786

IMAGE INTENSIFIERS AND METHOD OF PRODUCING SAME

David G. Holland, Braintree, and Peter B. Banks, Wickford, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 10, 1984, Ser. No. 659,543
Claims priority, application United Kingdom, Oct. 11, 1983, 8327115
Int. Cl.[4] H01J *40/18*; C03B *29/00*
U.S. Cl. 313—528 14 Claims



1. A method of manufacturing a shielded faceplate for use in an image intensifier comprising a photocathode, including the steps of: arranging in a mold a member of a first type of glass transparent to light to which the photocathode is sensitive, adjacent another member of a second type of glass which absorbs light to which the photocathode is sensitive, the mold being of material to which glass does not bond; heating the

members so that they fuse, thereby forming a block having a shape conforming to the internal configuration of the mold and having an inner region of the first type of glass and an outer region of the second type of glass; and removing the block from the mold.

11. A shielded faceplate for an image intensifier including a phtocathode, comprising an inner core of glass transparent to light to which the photocathode is sensitive, and an outer shielding region of glass which absorbs light to which the photocathode is sensitive which surrounds and is adjacent to the inner core, the inner core having a transverse dimension which decreases along its length, being smallest at the photocathode surface.

4,613,787

LAMPS FILAMENT SUPPORTS FOR TUNGSTEN HALOGEN INCANDESCENT

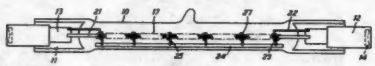
Reginald D. Swain, London, England, assignor to Thorn EMI Limited, London, England

Continuation of Ser. No. 230,811, Feb. 2, 1981, abandoned. This application Mar. 5, 1984, Ser. No. 585,028

Claims priority, application United Kingdom, Feb. 6, 1980, 8004025

Int. Cl.[4] H01K *1/18, 3/06*

U.S. Cl. 313—579 **24 Claims**



1. A linear filament assembly for a tungsten halogen incandescent lamp, the assembly including a generally linear coiled filament, a rigid insulating rod of refractory material selected from the group consisting of quartz, high silica content glass, high melting point alumino-silicate or borosilicate glass, or ceramic extending generally parallel to the filament and a plurality of support wires extending between the rod and the filament at spaced positions, each support wire having a diameter of less than about ten thousandths of an inch and having two ends, one end forming a support contacting the filament and the other end being secured to the rod by having been embedded in said rod when the material of the rod was in a softened state by heating.

4,613,788

ARRANGEMENT IN A TUNABLE HIGH FREQUENCY TRANSMITTER TUBE

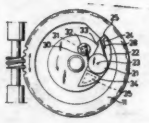
Klas I. Blomqvist, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

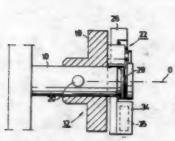
Filed Apr. 18, 1984, Ser. No. 601,517

Claims priority, application Sweden, Apr. 29, 1983, 8302434

Int. Cl.[4] H01J *25/50*

U.S. Cl. 315—39.61 **2 Claims**





1. An arrangement for transmitting a predetermined frequency, said arrangement including a high frequency transmitter tube comprising a stator and a tuning body rotatably attached thereto such that rotation thereof effects a periodically repeated continuous variation of the tuning frequency of the tube, said arrangement further including a mechanical locking device for interlocking the stator and the tuning body, said locking device comprising:

(a) a cam member attached to the stator, said cam member being positionally adjustable around an axis of rotation of the tuning body and including a ramp surface and a stop surface;

(b) a locking hook pivotably mounted to the tuning body and including first and second ends situated along different radii extending from a pivot thereof, the first end having a locking member disposed to enable contact with the cam member when said first end is pivoted toward said member, and the second end having a counterweight for producing a force to pivot the first end away from the cam member when the tuning body is rotated; and

(c) a spring member attached to the locking hook for urging the first end of said hook toward the cam member;

said counterweight providing sufficient force to prevent the first end of the locking hook from contacting the cam member when the tuning body is rotated above a predetermined speed;

said cam member being shaped such that at speeds lower than said predetermined speed, the first end slidably contacts the ramp surface when the tuning body is rotated in one direction but is stopped against the stop surface when the tuning body is rotated in the opposite direction, thereby stopping rotation of the tuning body; and

said arrangement transmitting a frequency determined by the angular position of the cam member when the tuning body is stopped.

4,613,789

SPARK PLUG WITH CAPACITOR SPARK DISCHARGE

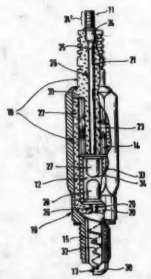
Werner Herden, Gerlingen, and Werner Bloss, Winterbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,555

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347027

Int. Cl.[4] H01J *7/44*

U.S. Cl. 315—58 **19 Claims**



1. Spark plug for combination with an Otto-type internal combustion engine having

a head or connecting end and a spark end;

a metal housing (19);

an insulator (18) located within the metal housing and formed with a central opening therein;

an externally accessible high-voltage terminal (11, 24, 24') sealed into the insulator;

a central electrode (26) centrally located within the insula-

tor, projecting from the insulator at an end remote from the externally accessible terminal and defining an ignition spark gap (13) with a counter electrode (30) secured to the metal housing;

a capacitor (14) located within the insulator and electrically connected in parallel to said ignition spark gap and dischargeable over said ignition spark gap (13);

a pilot or pre-discharge spark gap (12) located within the insulator and controlling discharge of the capacitor;

wherein

the insulator comprises

a two-part insulator structure having an end part portion (20) adjacent the spark end and a head part portion (21) adjacent the head end, said portions fitting telescopically within each other and being, respectively, dimensioned to leave a space therebetween defining a chamber (34);

said capacitor (14) and said pilot or pre-discharge spark gap (12) are located within said chamber; and

said chamber is filled with a pressurized gas, to place the pilot or pre-spark gap (12) within a space subject to gas under elevated pressure.

4,613,790

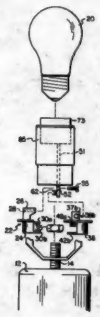
TOUGH-RESPONSIVE ELECTRIC LIGHT SOCKET

John W. Roorda, El Cajon, Calif., assignor to Westek Associates, San Diego, Calif.

Filed Jun. 4, 1985, Ser. No. 740,990

Int. Cl.[4] H01J *7/44*

U.S. Cl. 315—72 **20 Claims**



1. A touch-responsive electric light socket assembly, comprising:

an electrically-nonconductive, elongate, substantially tubular housing having two opposing open ends;

a socket shell means held in said housing adjacent a first one of said open ends for receiving the threaded end of an electric light bulb;

a touch-responsive circuit module disposed in said housing between said open ends and connected to said socket shell means for delivering electrical power to said socket shell in response to a power-control signal produced by a touch-control signal source;

a base member for fitting to said second housing end to support said housing on a lamp base;

first base means forming a first part of said base member for providing an electrically-conductive touch-control signal pathway to said touch-responsive circuit from a touch-control signal source; and

second base means forming a second part of said base for supporting an electrical power cable in conducting contact with said touch-responsive circuit and for electrically isolating said power cable from said electrically-conductive touch-control signal pathway.

4,613,791

AUTOMATIC LIGHT CONTROL APPARATUS FOR VEHICLE

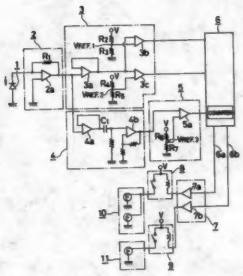
Norimitsu Kurihara, Wako; Yoshikazu Tsuchiya; Akira Kikuchi, both of Fujimi; Tohru Tanabe, Yokohama, and Kunio Okazaki, Hatano, all of Japan, assignors to Honda Motor Co., Ltd. and Stanley Electric Co., Ltd., both of Tokyo, Japan

Filed Jan. 28, 1985, Ser. No. 695,387

Claims priority, application Japan, Feb. 2, 1984, 59-18052; Mar. 29, 1984, 59-61729

Int. Cl.[4] B60Q *1/02*

U.S. Cl. 315—82 **11 Claims**



1. In an automatic light control apparatus for a vehicle, for selectively turning ON and turning OFF at least one of tail lamps, side marker lamps and head lamps of the vehicle in accordance with the amount of external light, comprising first detecting means for detecting the light level externally of the vehicle; and first generating means for generating at least one first control signal responsive to the detected external light level for controlling operation of said vehicle lamps,

the improvement comprising:

second detecting means for detecting an ON period of an illuminating light, external of said vehicle, and having a fluctuating light value;

second generating means responsive to said detecting of said ON period of said fluctuating light for generating at least one second control signal; and

control means responsive to said first and second control signals for controlling said lamps as a function of both said detected external light and said detected ON period of said fluctuating illuminating light.

4,613,792

SYMMETRICAL LOAD POWER REDUCTION DEVICE FOR LIGHTING FIXTURES

Peter R. Kroessler, 2532 Singing Vista Way, El Cajon, Calif. 92021

Filed Oct. 10, 1984, Ser. No. 659,278

Int. Cl.[4] H05B *39/00, 41/14*

U.S. Cl. 315—97 **11 Claims**

1. A power reduction device for being wired in series between a rapid start ballast and a lamp filament of one of the lamps of a conventional two-lamp rapid start fluorescent lighting fixture to reduce the power consumed by the fixture, comprising:

a step-up isolation transformer having a primary winding with a pair of input leads and a secondary winding having a pair of output leads;

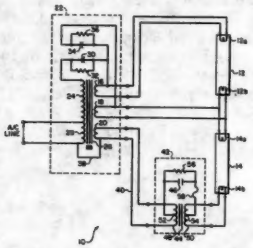
a capacitor;

a resistor connected in parallel across said capacitor;

means for connecting one side of said capacitor and resistor to said transformer primary winding; and

symmetric connection means for connecting the other side of said capacitor and resistor to said transformer second-

ary winding and for causing the device to present substantially the same impedance in a lamp fixture circuitry independent of which of said input leads is connected to a respective one of a pair of ballast filament output leads.

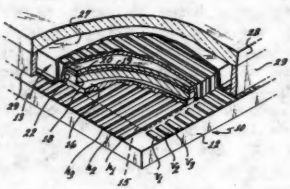


4,613,793

LIGHT EMISSION ENHANCING DIELECTRIC LAYER FOR EL PANEL

Ramachandra M. P. Panicker, Camarillo, and Walter F. Essinger, Thousand Oaks, both of Calif., assignors to Sigmatron Nova, Inc., Thousand Oaks, Calif.

Filed Aug. 6, 1984, Ser. No. 638,297
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.3 **8 Claims**



1. An improved structure for a thin-film electroluminescent device comprising:

a substrate;

a plurality of transparent front electrodes deposited on said substrate and extending in one direction;

a front dielectric layer deposited over said transparent front electrodes;

a phosphor layer having luminescent centers deposited over said front dielectric layer, said phosphor layer having a given refractive index;

a light emission enhancing dielectric layer having a refractive index substantially equal to that of the phosphor layer deposited over said phosphor layer;

a light sink layer deposited over said light emission enhancing dielectric layer;

a back dielectric layer deposited over said light sink layer; and

a plurality of back electrodes deposited over said back dielectric layer and extending orthogonally to the direction of said transparent front electrodes;

said front and back electrodes adapted to having a driving potential applied first in one polarity and then the opposite polarity across intersecting portions thereof during a refresh cycle;

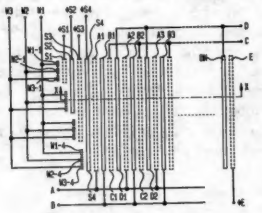
whereby during a refresh cycle when the back electrode at an intersecting portion is positive in potential the front dielectric layer coacts with the phosphor layer to generate light and when the front electrode at the intersecting portion is positive in potential the light emission enhancing dielectric layer coacts with the phosphor layer to generate light.

4,613,794

CHARGE TRANSFER PLASMA DISPLAY DEVICE

Osamu Oida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 555,088
Claims priority, application Japan, Nov. 25, 1982, 57-206743; Jun. 23, 1983, 58-113151
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.4 **8 Claims**



1. A charge transfer plasma display device comprising:

an enclosure having a plurality of parallel channels containing an ionizable medium, each of said channels being defined within a walled structure, at least one wall thereof being transparent;

a plurality of write electrodes provided on at least one inside wall surface, said write electrodes being arranged in a plurality of groups;

means for electrically connecting each one of said write electrodes belonging to each group to an associated write electrode in each of the other groups of write electrodes;

a plurality of transfer electrodes arranged in alternating sequence and offset from one another on opposite inside wall surfaces;

a plurality of input shift electrodes arranged in alternating sequence and offset from one another on opposite inside wall surfaces, said input shift electrodes being located between said write electrodes and said transfer electrodes such that the number of said input shift electrodes present in plan view between each one group of said write electrodes and said transfer electrodes is different from the number of said input shift electrodes present in plan view between every other group of said write electrodes and said transfer electrodes;

means for applying pulses in a predetermined successive manner to said transfer electrodes;

means for applying pulses selectively to one of said input shift electrodes and said write electrodes; and

means for applying pulses in a predetermined successive manner to the other of said input shift electrodes and said write electrodes.

4,613,795

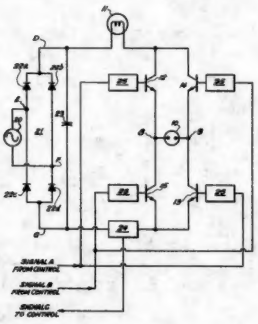
DRIVER CIRCUIT CONTROLLER FOR AC TO AC CONVERTERS

Abdallah M. Itani, Ballston Spa, and Victor D. Roberts, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 24, 1985, Ser. No. 748,076
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—205 **10 Claims**

1. A method for controlling the switches of an AC to AC converter synchronously with an AC supply, said converter including a diode rectifier and a plurality of switches coupled to said rectifier in a manner to supply power to a load, said method comprising the steps of:

determining when the diodes in said diode rectifier are off; and



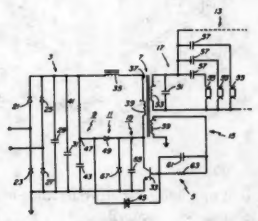
turning said switches on and off so as to supply AC power to said load, the conducting states of said switches being changed upon determining that said diodes are off.

4,613,796

SINGLE TRANSISTOR OSCILLATOR BALLAST CIRCUIT

David L. Bay, Beverly, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1984, Ser. No. 639,764
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—219 **13 Claims**



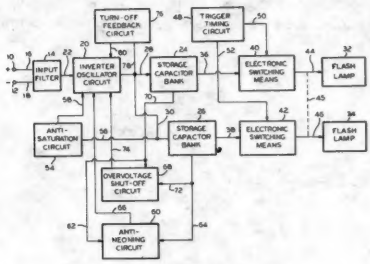
1. A single power transistor oscillator circuit comprising:
oscillator means including a single transistor;
means for developing a DC potential connectable to an AC potential source;
starting circuit means including a series connected resistor and capacitor shunting said means for developing a DC potential and coupled to said transistor of said oscillator means;
starting circuit disablement means coupled to said starting circuit means and to said transistor of said oscillator means for discharging said capacitor of said starting circuit means through said single transistor oscillator means;
inductor means coupling said means for developing a DC potential to said oscillator means and to a load circuit; and
first potential shaping means shunting said inductor means coupled to said load circuit for shaping an output potential therefrom to provide a substantially symmetrical AC potential having a zero DC voltage central axis.

4,613,797

FLASH STROBE POWER SUPPLY

Frederick W. Eggers, Folsom, Calif.; Paul D. Graham, and Bruce E. Heeb, both of Frankfort, Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.

Filed Jul. 27, 1984, Ser. No. 635,132
Int. Cl.[4] H05B *41/30, 41/34*
U.S. Cl. 315—241 R **20 Claims**



1. A flash strobe power supply adapted for controlling alternately the energization of a pair of flash lamps, said power supply comprising:
trigger timing means for generating a series of positive pulses and a series of negative pulses spaced in time from said positive pulses by a predetermined interval;
first separate and independent energy storage means for repeatedly charging incrementally during successive charging cycles and for storing a charge to be applied to a first flash lamp;
second separate and independent energy storage means for repeatedly charging incrementally during successive charging cycles and for storing a charge to be applied to a second flash lamp;
inverter oscillator means for generating a quasi-square wave signal whose frequency is greater than the frequency of said positive pulses to control the incremental charging of said first and second storage means, said inverter oscillating means including pulse generating means and a transformer having a primary and a secondary winding;
first switching means for delivering when conductive the charge stored in said first energy storage means to said first flash lamp, said first switching means being responsive to said positive pulses of said timing means for rendering it conductive to permit the discharging of the charge stored in said first energy storage means through said first flash lamp; and
second switching means for delivering when conductive the charge stored in said second energy storage means to said second flash lamp, said second switching means being responsive to said negative pulses of said timing means for rendering it conductive to permit the discharging of the charge stored in said second energy storage means to said second flash lamp.

4,613,798

ELECTRIC-POWERED SPRING-RETURN ACTUATING DEVICE

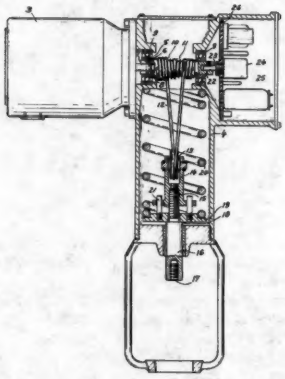
Peter H. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Apr. 1, 1985, Ser. No. 718,799
Int. Cl.[4] F16K *31/44*
U.S. Cl. 318—160 **4 Claims**

1. Electric actuating means comprising:
(a) electric motor means with output shaft, said shaft capable of being rotary motivated by suitably switched electric currents to said motor and further being capable of retaining a fixed position when said motor is subjected to polarity-fixed electric currents;
(b) electrical amplifying circuit means capable of first

switching electric current to said motor capable to rotate the shaft in one direction, secondly to generate a sufficiently constant current for holding said shaft in a desired position, and thirdly to de-energize the motor completely if rotating of said motor shaft in the opposite direction is desired;

(c) mechanical means motivated by said electric motor shaft and capable of converting more than fifty percent of the motor's mechanical rotary power output into reciprocating mechanical power, said mechanical means coupled to



at least one stem and at least one mechanical spring, the latter capable of overcoming mechanical or electrical resistance forces and further being able, together with said mechanical means, to rotate said electric motor shaft whenever said electric motor is substantially de-energized and wherein said mechanical means comprises a suitably supported spindle having two seperate threaded sections with differing pitch diameters, at least one cable, portions of which being wound around each threaded section of said spindle, and one or more pulleys capable of engaging said cable and motivating said stem.

4,613,799

MOTOR VELOCITY CONTROL CIRCUIT

Yasuaki Sumi, Tottoru, Japan, assignor to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of, Japan

PCT No. PCT/JP83/00079, § 371 Date Oct. 17, 1983, § 102(e) Date Oct. 17, 1983, PCT Pub. No. WO83/03325, PCT Pub. Date Sep. 29, 1983

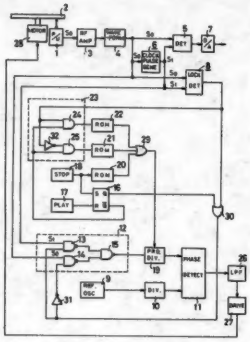
PCT Filed Mar. 14, 1983, Ser. No. 545,393

Claims priority, application Japan, Mar. 18, 1982, 57-44252; Apr. 26, 1982, 57-70673; Apr. 26, 1982, 57-70674; Jan. 12, 1983, 58-3653

Int. Cl.⁴ H02P *5/00, 5/16*

U.S. Cl. 318—314 **11 Claims**

1. A motor velocity control circuit for a motor driving a disc of a constant linear velocity system, characterized in that said circuit comprises a demodulated clock signal generating means for generating a demodulated clock signal in synchronism with a data signal detected from said disc, a switching control means for switching and outputting said demodulated clock signal output from said demodulated clock signal generating means and said data signal detected from said disc, a reference oscillator, a phase comparison means which adopts the output signal of said reference oscillator as the reference signal and the demodulated clock signal or data signal selected by said switching control means as the comparison signal, thereby phase-comparing both said signals, and a means for driving and



controlling said motor corresponding to an error output from said phase-comparison means.

4,613,800

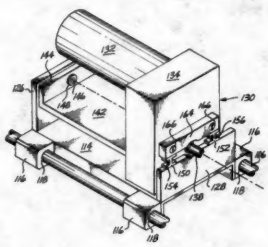
SERVO SYSTEM FOR MEASURING AND CONTROLLING THE AMOUNT OF TORQUE BEING APPLIED TO ROTATING TOOLS AND METHOD

Jan Jeppsson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 21, 1984, Ser. No. 653,520

Int. Cl.⁴ H02K *17/32;* **H02P** *7/00*

U.S. Cl. 318—434 **31 Claims**



1. A method of obtaining a set torque value in a rotating tool driven by a servomotor, comprising:

mounting a servomotor and reduction gear box, having a rotatable drive shaft output portion for a torquing tool, on two support members on opposite sides of the drive shaft output portion; said shaft output portion extending from the gear box toward the torquing tool;

securing strain gages to the two support members on the output side of the gear box and measuring servodrive reaction torque in the shaft output portion with the strain gages when the shaft is rotated to apply torque to a workpiece;

setting a final torque value, by an input command to an electrical servo system, to be applied by a tool on the shaft;

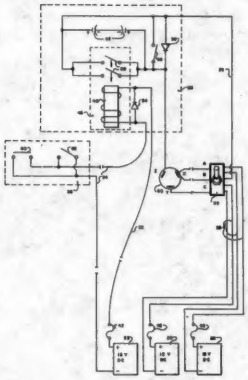
receiving signals from the strain gages in the electrical servo system; and

providing, by means of the electrical servo system, a slowing of the servomotor as the torque increases and a smooth, low speed approach to the set final torque value in the shaft.

4,613,801
TROLLING MOTOR FOOT CONTROL WITH ARC SUPPRESSOR

Mabry Tatom, Jr., Box 282, Sweetwater, Tex. 79556

Filed Jul. 16, 1984, Ser. No. 631,320
Int. Cl.[4] H01H *9/30*
U.S. Cl. 318—440 **4 Claims**



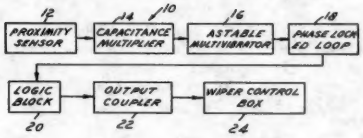
1. A boat having
a DC powered trolling motor mounted thereon,
at least one motor battery on the boat for supplying direct current
a motor electrical circuit connecting the motor battery and the motor,
wherein the improved trolling motor control system comprises:
a relay having
a relay switch in the motor circuit for disconnecting and connecting the motor battery and trolling motor, and
a relay actuator coil that opens and closes the relay switch responsive to changes in current supplied to the relay coil,
an equipment battery on the boat,
a control electrical circuit connecting the equipment battery and the relay coil,
at least one control switch in the control circuit for electrically connecting and disconnecting the motor battery and the trolling motor, and
at least two capacitors in the motor circuit shunter cross the relay switch,
said capacitors being in nonpolarized, series relation,
an electrical connector set in the motor circuit providing for disconnection of the motor from the motor circuit end connection of charging means for charging said motor battery,
a charging diode shunted across said relay switch,
said charging diode being oriented in the motor circuit such that when the relay switch is open, current may pass from said charging source to the batteries, but not from the batteries to the charging means or to the motor when either is connected.

4,613,802
PROXIMITY MOISTURE SENSOR

Richard A. Kraus, Coral Springs, Fla., and Thomas W. Sabon, Southgate, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 17, 1984, Ser. No. 682,501
Int. Cl.[4] H02P *1/04*; B60S *1/04*
U.S. Cl. 318—483 **2 Claims**

1. A device for detecting the presence of water adjacent a first side of a windshield, having two generally planar opposing sides, includes:
a capacitance sensor means coupled to a second side, opposite from the first side, of the windshield to detect capacitance changes so that said capacitance sensor means is shielded from the water by the windshield;
an astable multivibrator means coupled to said sensor means for generating an output signal to translate the magnitude of the detected capacitance to the frequency domain;
a phase-locked loop means coupled to said multivibrator means for developing a phase pulse as a function of frequency change of the output signal of said multivibrator means;
a logic means coupled to said phase-locked loop means and responsive to the phase pulse for generating a control

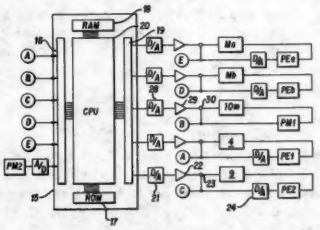


output indicating water adjacent the windshield and activating a windshield wiper;
said phase-locked loop means having a longer time constant response to a decrease in the frequency of the output of said multivibrator means than to an increase in the frequency of the output of said multivibrator means so that the output phase pulse of said phase-locked loop means widens in response to water adjacent the windshield;
said logic means producing a control signal in response to a coincidence between the phase pulse and a signal affected by the output of the multivibrator; and
said capacitance sensor including a first sensor plate coupled to the windshield and a second sensor plate coupled to the windshield and to ground for establishing a local ground plane.

4,613,803
INDUSTRIAL ROBOT AND A METHOD FOR POSITIONING SAME

Kiyoshi Hasegawa; Hisashi Matsuo, and Hideki Hashimoto, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 14, 1985, Ser. No. 701,621
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568 **3 Claims**



1. A self-traveling robot system, comprising:
a robot for working on a continuous object;
means for moving said robot along said continuous object;
a swiveling table mounted on said means for moving said robot and provided with vertically extending outrigger members;
arm means provided on said swiveling table, said arm means having a plurality of degrees of freedom;

distance detection means mounted to said robot for detecting a distance between said robot and said continuous object;

means to separate said outrigger members from said members for moving said robot and which includes means for rotating said means for moving said robot at a right angle;

a deviation detecting circuit for comparing said distance as detected by said distance detection means with a predetermined value and detecting a deviation between said distance and said predetermined value; and

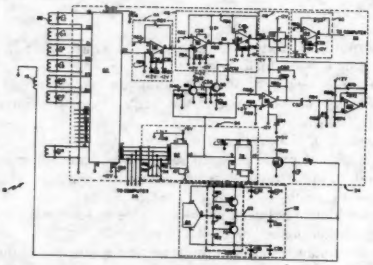
travel path correcting means for correcting an advance direction of said means for moving said robot according to said deviation.

4,613,804

FLOOR POSITION SENSING APPARATUS AND METHOD

Ronald R. Swenson, Salt Lake City, Utah, assignor to Eaton-Kenway, Inc., Salt Lake City, Utah

Filed Jul. 8, 1985, Ser. No. 752,865
Int. Cl.[4] G05D *1/00*
U.S. Cl. 318—587 **26 Claims**



1. A guidance system for guiding at least one unmanned trackless work-producing vehicle, the system comprising:

at least one unmanned trackless work-producing vehicle;

metallic bench mark means separate from said vehicle;

sensor means carried on the vehicle, the sensor means comprising means by which a plurality of magnetic fields are selectively generated, one of said magnetic field being around said metallic bench mark means, means producing a composite voltage proportional to the summation of the plurality of magnetic fields and means periodically sampling said composite voltage, said sampling means being in electrical communication with said composite voltage producing means; and

control means in electrical communication with the sensor means receiving and analyzing each sampled composite voltage and controlling the displacement of the vehicle based on said analysis.

4,613,805

CONVEYOR SYSTEM

Yukito Matsuo; Masuo Tamada, both of Yokohama; Takashi Sawafuji, and Teruo Azukizawa, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1985, Ser. No. 726,775
Claims priority, application Japan, Apr. 26, 1984, 59-85969
Int. Cl.[4] G05B *11/00*
U.S. Cl. 318—687 **17 Claims**

1. A conveyor system for running a carriage (1) by utilizing the inertia thereof along a conveyance path (6) comprising:

a main power source (21) for driving said carriage;

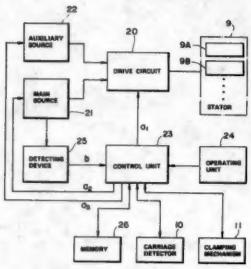
an auxiliary power source (22) for driving said carriage when said main power source becomes faulty;

a plurality of spaced apart drive means (9) disposed along said conveyance path for imparting a forward propelling force or a reverse propelling force to said carriage by using said main power source or said auxiliary power source;

means (25) for detecting an abnormal condition of said main power source;

transfer means (23) responsive to an abnormal signal outputted by said abnormal condition detecting means for switching a drive source from said main power source to said auxiliary power source

position detecting means (10) for detecting a position of said carriage running along said conveyance path;



first control means (20, 23) which, when said abnormal signal is outputted, selects said drive means based on an output of said position detecting means so as to drive said drive means from said auxiliary power source thereby running said carriage to a position of said drive means, and

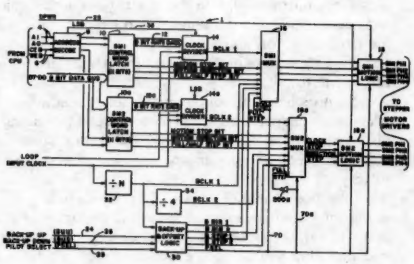
second control means for stopping said carriage at a position of a predetermined one of said drive means driven by said first control means by actuating a predetermined one of said drive means by using said auxiliary power source.

4,613,806

STEPPER MOTOR LOGIC CIRCUIT

Miroslawa Majewski, Detroit, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Jan. 22, 1985, Ser. No. 692,968
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **23 Claims**



1. A stepper motor logic circuit for providing stepper motor at variable rates, comprising:

data input means for storing clock rate data and stepper motor control data;

stepper motor clocking means connected with said data input means for receiving the clock rate data and for providing a series of stepper motor clocking pulses at a frequency proportional to the clock rate data; and

logic means for receiving the series of stepper motor clocking pulses and the stepper motor control data and for providing at its output a digital stepper motor control

signal having a logic state determined in accordance with the stepper motor control data, said stepper motor control signal provided at a rate proportional to the frequency of the stepper motor clocking pulses, and logic means including a counter means for receiving the stepper motor clocking pulses and the stepper motor control data and for providing a series of counter output signals at a rate proportional to the frequency of the stepper motor clocking pulses, each said counter output signal having a digital numerical value that changes in accordance with the stepper motor control data, said logic means further comprising a decoding means for receiving and decoding the counter output signals and for changing the logic state of the stepper motor control signal in accordance with the decoded numerical values of said counter output signals.

4,613,807

LOW-NOISE SYSTEM FOR MEASURING FREQUENCY IN MULTIPHASE POWER TRANSMISSION SYSTEMS

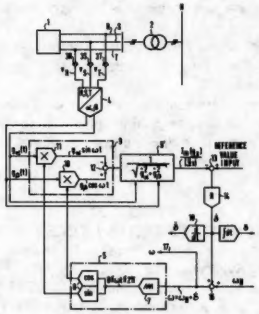
Gerhard Hosemann, Rathsberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,457

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303454

Int. Cl.[4] G01R *23/02*

U.S. Cl. 318—807 8 Claims



1. A method for measuring frequency in a multiphase line system for the transmission of electrical power, the method comprising the steps of:

producing measurement values corresponding to electrical quantities on the multiphase line system;

forming orthogonal components of a neutral-point-less measurement value system;

forming two variable elements of a transformation matrix from a control variable, said variable element having a frequency proportional to said control variable;

forming a direction-determining quantity of a space vector from said orthogonal components and said variable elements of said transformation matrix; and

presetting a desired value for said direction-determining quantity of said space vector, said control variable being controlled in such a manner that said space vector has a constant direction, said control variable corresponding to a measured frequency value.

4,613,808

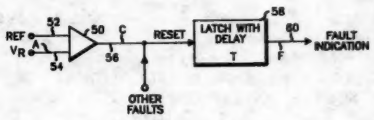
FAULT DETECTOR FOR AN ALTERNATOR

Arthur J. Edwards, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 11, 1985, Ser. No. 700,218

Int. Cl.[4] H02J *7/14*

U.S. Cl. 322—99 9 Claims



1. In a system for charging a battery from an alternator capable of developing a static voltage due to leakage current in the alternator, a circuit for sensing a non-operating alternator, comprising:

first means for establishing a threshold selected to be outside the range of the alternator's static voltage, and being coupled to the alternator for sensing the unrectified output thereof and for generating a control signal whenever the alternator's sensed output does not exceed said threshold; and

second means responsive to the control signal for generating an indication of a non-operating condition in the alternator.

4,613,809

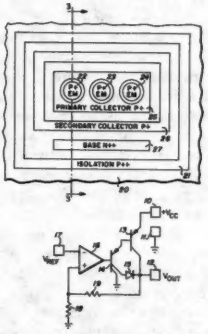
QUIESCENT CURRENT REDUCTION IN LOW DROPOUT VOLTAGE REGULATORS

Timothy J. Skovmand, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 2, 1985, Ser. No. 751,117

Int. Cl.[4] G05F *1/59*

U.S. Cl. 323—268 4 Claims



1. An integrated voltage regulator circuit having positive and negative supply rails connectable to a source of operating power, said circuit having a low dropout voltage, a low quiescent current and comprising:

a PNP pass transistor having an emitter coupled to said positive supply rail a collector providing the regulated output voltage and a base;

a PNP control transistor having a base, an emitter coupled to said base of said pass transistor, a lateral primary collector coupled through a normally forward biased diode to said collector of said pass transistor and a secondary collector normally subservient to said lateral primary collector and capable of collecting injected current carriers when said lateral primary collector saturates;

a diff amp having an output coupled to said base of said

control transistor, a noninverting input coupled to a reference potential and an inverting input; and

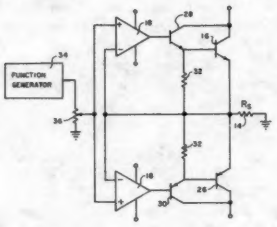
voltage divider means coupled between said collector of said pass transistor and said diff amp inverting input.

4,613,810

HIGH OUTPUT PROGRAMMABLE SIGNAL CURRENT SOURCE FOR LOW OUTPUT IMPEDANCE APPLICATIONS

Daniel G. Jablonski, Silver Spring, Md., and Richard W. Watkins, Goleta, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 10, 1985, Ser. No. 732,330
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—271 **1 Claim**



1. A programmable current source comprising:

a complementary output stage comprising a pair of complementary output devices each having a signal input terminal, a current input terminal, and a current output terminal, the current output terminal of each of the two complentary devices being directly connected to each other and an external load having a current return path to ground, the current input terminals of each of the devices being directly connected to an appropriate polarity of an external complementary power source having a current return to said ground, each of the pair of complenmentary output device drawing a respective drain current from the respective polarity of the complementary power source through the load to ground, and the input signal terminal being adapted for receiving appropriate polarities of signal for the respective output devices to drive a corresponding current through the load, the input terminals having a respective input offset characteristic with respect to the respective current output terminal,

amplifier means each having a signal input terminal, an output terminal, and a negative feedback input terminal, the output terminals being connected to respective input terminals of the output devices, the feedback terminal being connected to the load, for virtually eliminating the input offset of the respective output device, and

signal generation means for generating a function signal and feeding said signal to the output devices through the amplifier means for driving a corresponding polarity of current through the load,

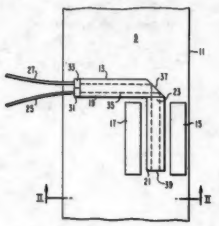
the external load being a resistance provided by electrical conduction of a liquid with which the current source is used and the power supply drain current source being switchable from a first power supply drain current to a second power supply drain current by immersion or removal of the output and ground terminals from the liquid.

4,613,811

FARADAY CURRENT SENSOR WITH FIBER OPTIC COMPENSATED BY TEMPERATURE, DEGRADATION, AND LINEARITY

Eugene G. Vaerewyck, Albuquerque, N. Mex.; Cheng-Lin Chen, Pittsburgh, and Juris A. Asars, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 647,203
Int. Cl.[4] G01R *15/07*; G02F *1/09*
U.S. Cl. 324—96 **5 Claims**



1. A device for measuring the current flowing through an electric conductor, comprising:

(a) a body of magneto-optical material within the magnetic field lines of a current-carrying conductor and including two components;

(b) one of the components extending substantially parallel to the direction of flow of the current and the other component extending substantially normal thereto;

(c) magnetic means for directing magnetic field lines of direct current through the body;

(d) polarizing means for directing a beam of polarized light into the body which beam is reflected through the body components;

(e) analyzer means for detecting rotation of the polarized light beam and for generating an output signal in response thereto; and

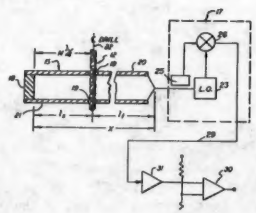
(f) electronic means responsive to the output signal for producing an electronic signal proportional to the current and compensated for temperature, loop degradation, and linearity.

4,613,812

MICROWAVE DETECTION SYSTEM

Norbert E. Gelston, II, Skaneateles, N.Y., assignor to U.S. Tech Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 579,680, Feb. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 446,333, Dec. 2, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 683,160
Int. Cl.[4] G01R *27/04*; B23B *39/04*
U.S. Cl. 324—58.5 B **17 Claims**



1. A microwave detection system useful for detecting the presence or absence of a target within a microwave transmis-

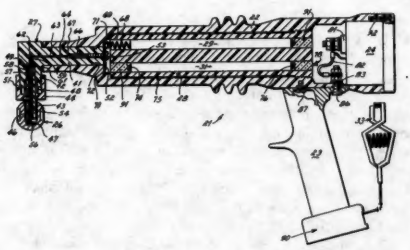
sion line which comprises a microwave transmission line having an opening within which the target is situated and means for transmitting a microwave signal down the transmission line toward the target and for receiving a reflected return wave signal traveling the opposite direction positioned at one end of the transmission line and forming a transmitter/receiver means connected to said system for transmitting and receiving signals to provide an output signal having a component which indicates the presence or absence of the target within the transmission line opening and processing means coupled directly to the output of the said transmitter/receiver means for comparing the component to a predetermined level to determine the presence or absence of the target, the position of the transmission line opening relative to the transmitter/receiver means is selected to optimize the signal strength from the transmitter/receiver means and is less than the length of the transmission line.

4,613,813

ELECTROSTATIC SYSTEM ANALYZER

James A. Kolibas, Broadview Heights, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 18, 1984, Ser. No. 611,863
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—72 **8 Claims**



1. An analyzer for a high voltage electrostatic coating system comprising:

an elongated analyzer body having a longest dimension with an end proximal to a user of the analyzer and a distal end;

a meter mounted at the proximal end of the analyzer body having a meter face visible to a user of the analyzer;

a high resistance path in the analyzer body having a first end coupled to the meter and having a second end;

a fitting on the distal end of the analyzer body including a conductive path electrically coupled to the second end of the high resistance path in the analyzer body; and

a conductive electrode electrically coupled to the conductive path of the fitting, for contacting test points of the electrostatic coating system, mounted on the fitting offset laterally relative to the longest dimension of the analyzer body so that the electrode and the meter face are simultaneously visible to a user of the analyzer.

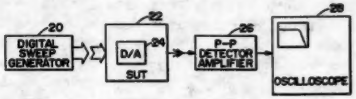
4,613,814

METHOD OF MEASURING A FREQUENCY DOMAIN CHARACTERISTIC

Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 479,390, Mar. 28, 1983, abandoned.
Filed Apr. 1, 1985, Ser. No. 718,662
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B **12 Claims**

1. A method of measuring a frequency domain characteristic of a digital system under test, comprising applying to the system under test a digital signal corresponding to a swept frequency analog signal, and deriving from an output signal of the



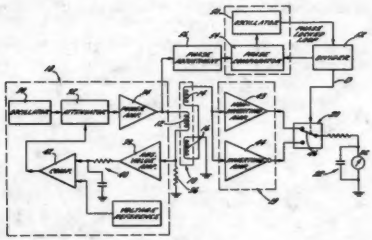
system under test a measure of the peak-to-peak amplitude of the corresponding analog signal.

4,613,815

ELECTROMAGNETIC DETECTOR FOR METALLIC MATERIALS HAVING AN IMPROVED PHASE DETECTION CIRCUIT

Conrad Christel, Jr., Dryden, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Apr. 27, 1983, Ser. No. 489,175
Int. Cl.[4] G01N *27/72;* G01R *33/12*
U.S. Cl. 324—233 **11 Claims**



1. An electromagnetic detector for sensing metallic material in a filter element comprising, in combination:

a cylindrical form having means defining a test position and adapted to receive a filter element in said position for test;

a differential transformer having an input coil and a pair of pick-up coils wound on said cylindrical form, one of said pick-up coils being located adjacent a filter element in said position for test;

a signal source of signals of selected frequency applied to said input coil having a feedback loop to maintain a constant alternating current level in said input coil for generating a balanced alternating magnetic field linking said pair of pick-up coils; and

a detector circuit connected to receive combined and opposed signals induced in said pick-up coils by said alternating magnetic field, said combined signals being effectively opposed and cancelled when metallic material is not present in a filter element in said cylindrical form for test and the magnetic field is balanced, and being imbalanced when metallic material is present in a filter element in said cylindrical form for test and the magnetic field is imbalanced, the imbalanced signals producing metallic-representing input signals from said pick-up coils with a particular phase relative to said source signals, and said detector circuit including phase sensitive determining means for discriminating between input signals of a particular phase representing metallic material in the filter element under test and other input signals having a different phase and representing other metallic materials in proximity to said pick-up coils,

said phase sensitive determining means including:

(a) operational amplifier means connected to receive the input signals and operable to produce non-inverted signals and inverted signals;

(b) means including a connection to said signal source for

producing driver signals having the same frequency as and a selected phase relative to the input signals;

(c) output signal sensing means; and

(d) switch means connected to receive the driver signals and operable in combination with said operational amplifier means to transmit to said outut signal sensing means the non-inverted signals and the inverted signals during alternate time intervals determined by the frequency and phase of the drive signals, and thereby provide output signals determined by the input signals representing the metallic material in the filter element under test.

4,613,816

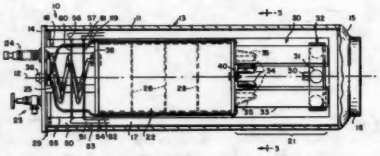
CRYOGENIC MAGNETIC PROBE HAVING NEW SUBSTRATE

Geoffrey H. Zeamer, Dedham, Mass., assignor to Geo-Sensors Corporation, Medway, Mass.

Filed Apr. 3, 1984, Ser. No. 596,436

Int. Cl.[4] G01R *33/035, 33/022, 33/24*

U.S. Cl. 324—248 **16 Claims**



1. A magnetic probe for detecting the range and direction of magnetic anomalies comprising:

(a) a housing defining a chamber;

(b) cryogenic means mounted inside said chamber for maintaining the interior of said chamber at cryogenic temperatures;

(c) magnetic sensing means including:

(i) substrate means situated in said chamber for supporting magnetometer means and a plurality of gradiometer coil means for sensing magnetic field components along selected axes, said substrate means comprising plate means having depending from opposing edges thereof pairs of skirt means, said plate means further supporting a magnetometer support means, each of said pairs of skirt means including means for supporting said gradiometer coil means and said plate means including means adjacent each said skirt means for supporting a said gradiometer coil means, said substrate means being thermally connected to said cryogenic means to maintain said substrate, said magnetometer means and said gradiometer coil means at cryogenic temperatures; and

(ii) detection means situated in said chamber and in thermal contact with said cryogenic means to maintain said detection means at cryogenic temperatures, said detection means being electrically connected to said magnetomer means and to said gradiometer coil means for detecting the direction, strength and gradient of the ambient magnetic field, thereby to provide information as to the direction and range of the magnetic anomalies with respect to the probe.

4,613,817

SUPERCONDUCTING GRADIOMETER COIL SYSTEM FOR AN APPARATUS FOR THE MULTI-CHANNEL MEASUREMENT OF WEAK NONSTATIONARY MAGNETIC FIELDS

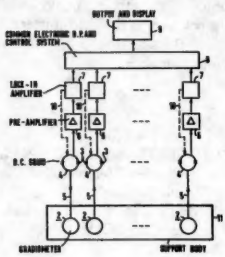
Eckhardt Hoenig, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,478

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324208

Int. Cl.[4] G01R *33/02, 33/035*

U.S. Cl. 324—248 **8 Claims**



1. In a superconducting gradiometer coil system for an apparatus for the multi-channel measurement of non-stationary weak magnetic fields in a field intensity range of less than 10^{-10}T and in particular less than 10^{-12}T, said apparatus including in each channel gradiometer means having at least one magnetic field detection coil and at least one magnetic field compensation coil associated with said detection coil, a superconducting quantum interference device, superconducting connecting means connecting said gradiometer means to said superconducting quantum interference device, and which further comprises electronic means for evaluating, processing and displaying data generated by said superconducting quantum interference device, the improvement comprising each of said detection coils and each of said compensating coils being connected together by mutual connecting elements and being deposited as planar thin-film structures in at least one plane on a common rigid support body, the compensation coil for each of said detection coils being disposed in one location in a reference coil arrangement about which said detection coils are disposed.

4,613,818

NUCLEAR MAGNETIC RESONANCE BLOOD FLOWMETER

Joseph H. Battocletti, River Hills; Richard E. Halbach, Brookfield; Frederick J. Antonich; Anthony Sances, Jr., both of Milwaukee, and Thomas A. Knox, Brookfield, all of Wis., assignors to The Medical College of Wisconsin, Inc., Milwaukee, Wis.

Filed Jun. 20, 1983, Ser. No. 505,686

Int. Cl.[4] G01N *24/06, 24/08;* **G01R** *33/22*

U.S. Cl. 324—306 **20 Claims**

1. An improved nuclear magnetic resonance blood flowmeter for non-invasively measuring blood flow in a human limb comprising:

polarizing magnet means for generating a substantially uniform magnetic field;

a limb receiving lumen for supporting a human limb within the field generated by said polarizing magnet means so that blood molecules within the limb are magnetically polarized thereby;

transmitter means located adjacent said lumen for inducing a nuclear magnetic resonance response in the blood molecules of the human limb disposed within said lumen;

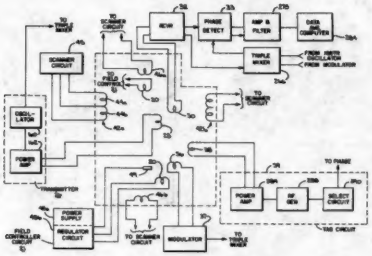
scanning means including:

first means for generating a first pair of opposing magnetic fields within said lumen for cancelling the nuclear magnetic resonance response induced by said transmitter means everywhere except within a first null plane along which said first opposing magnetic fields cancel each other;

second means for generating a second pair of opposing magnetic fields which are each at a preselected angle to each of the magnetic fields of said first pair of opposing magnetic fields for cancelling the nuclear magnetic resonance response everywhere along a second null plane at which said second pair of opposing magnetic fields cancel each other, said second null plane being at said preselected angle to said first null plane so that a nuclear magnetic resonant response occurs only along a line formed by the intersection of said first and second null planes;

control means coupled to said first and second means for generating said first and second pair of opposing magnetic fields for varying the strength of the opposing magnetic field generated by said first and second means for generating said first and second pair of opposing magnet fields to shift the location of said first and second null planes across said lumen so as to displace said line of intersection of said null planes through the human limb disposed in said lumen;

detector means disposed in part in said lumen for detecting the nuclear magnetic resonance response induced in said lumen and for generating an output signal which varies in accordance with blood flow through said limb;



wherein said polarizing magnet means includes:

first and second oppositely poled magnets, located on opposite sides of said lumen for producing a magnetic field which permeates said lumen; and

field stabilizer means carried in part by each of said first and second magnets for stabilizing the field produced thereby so as to maintain a substantially constant field between said first and second magnets, said field stabilizer means having first and second electromagnetic coils each located on the pole face of a separate of said first and second magnets, a temperature-compensated field controller circuit coupled to each of said first and second electromagnetic coils for energizing said first and second electromagnetic coils in accordance with the magnetic field present between said first and second magnets to maintain stability of the magnetic field, and a pair of magnetic shims each circumscribing the pole face of a separate one of said first and second oppositely poled magnets for maintaining coarse homogeneity of the field of each respective magnet;

wherein said temperature-compensated field controller circuit comprises:

a flux sensor disposed within the magnetic field of said first and second magnets for providing an output signal which varies in accordance with the magnetic field of said first and second magnets;

means in thermal contact with said flux sensor for maintaining said flux sensor at a substantially constant temperature; and

amplifier means coupled to said flux sensor and to each of said first and second electromagnetic coils for energizing said electromagnetic coils in accordance with the flux sensor output signal.

4,613,819

NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

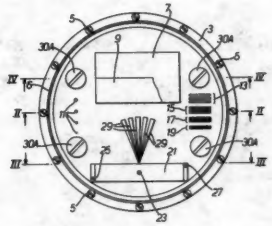
Kui M. Chui, Ickenham, England, assignor to Picker International Ltd., Wembley, England

Filed Feb. 19, 1985, Ser. No. 702,502

Claims priority, application United Kingdom, Feb. 27, 1984, 8405065

Int. Cl.[4] **G01R** *33/20*

U.S. Cl. 324—308 **21 Claims**



1. An NMR imaging phantom comprising an enclosure containing a member of a first material having a first known NMR response, the member being shaped so as to provide in a planar slice intersecting said member a length of said material whose dimension in the direction of the width of the slice varies linearly along said length of material from substantially zero to a value equal to the thickness of the slice; and the enclosure being otherwise filled in the direction of the thickness of the slice, at least over said length, with a second material having a second known NMR response.

4,613,820

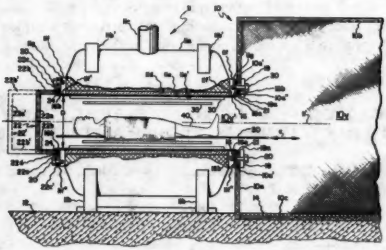
RF SHIELDED ROOM FOR NMR IMAGING SYSTEM

William A. Edelstein; David R. Eisner; Rowland W. Redington, and Lowell S. Smith, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,803

Int. Cl.[4] **G01R** *33/20*

U.S. Cl. 324—318 **20 Claims**



1. A radio-frequency (RF) shielded room for use in a nuclear-magnetic-resonance (NMR) imaging system having magnet means having a bore therethrough and having first and

second opposed surfaces respectively at the respective opposite ends of said magnet means bore, comprising:

at least one electrically-conductive shield wall means for substantially enclosing a workroom volume adjacent to said magnet means bore first end without enclosing any portion of the bore of said magnet means, said at least one wall means having an aperture formed through at least a portion thereof, said aperture being substantially in registration with, and adjacent to, said magnet means bore first end; and

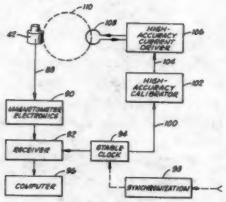
electrically-conductive means, extending at least partly through said magnet means bore from said first end toward said second end and conductively joined to the periphery of said wall means aperture, for substantially enclosing an imaging volume extending at least partly through said magnet means bore and joined to said workroom volume to form a unitary volume of the RF shielded room.

4,613,821

METHOD AND APPARATUS FOR OBTAINING HIGH ACCURACY SIMULTANEOUS CALIBRATION OF SIGNAL MEASURING SYSTEMS

Ben K. Sternberg, and Richard W. Nopper, Jr., both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 10, 1983, Ser. No. 457,045
Int. Cl.[4] G01V *3/00*
U.S. Cl. 324—323 **13 Claims**



1. A system for calibration of an electrical data signal measurement indication simultaneous with data signal acquisition, comprising:

means for acquiring said data signal;

means for injecting a calibration signal into the data signal that has interleaving and non-interfering amplitude and phase spectra relative to the data signal in the frequency domain, and that has precisely known frequency characteristics;

means for processing the combined data signal and calibration signal to derive a precisely corrected complex data signal spectrum in the frequency domain; and

means for Fourier transforming said corrected complex data signal to a corrected data signal in the time domain.

4,613,822

VARIABLE HIGH-CURRENT ELECTRICAL LOAD BANK WITH RAPID ADJUSTMENT OVER A WIDE RANGE OF CURRENTS

Donald Reid, 4000 de Maisonneuve (Apt. 2005), Montreal (Québec), Canada H3Z 1J9

Filed Oct. 21, 1983, Ser. No. 544,086
Int. Cl.[4] G01N *27/46;* **H01C** *10/12*
U.S. Cl. 324—426 **24 Claims**

1. An adjustable high current electrical load comprising:

a frame;

first and second electrically conducting means, said first conducting means having a first surface and said second conducting means having a second surface facing said first surface, said first conducting means being fixedly mounted on said frame;

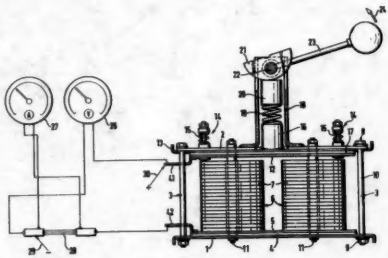
first spring means, said second conducting means being mechanically connected to said frame through said first spring means;

at least one pile of elements made substantially of carbon material, which pile being disposed between said first and second surfaces of the first and second conducting means, said at least one pile having a first and a second end facing respectively said first and second surfaces and having an electrical resistance between its first and second ends which varies with pressure applied on said at least one pile through its first and second ends, said first and second conducting means being mounted with respect to each other for applying substantially no pressure on said at least one pile during a non-operating state of said adjustable electrical load;

means associated with said second conducting means for applying pressure on said at least one pile through said second conducting means, said at least one pile being pressed between said first and second surfaces when said pressure applying means apply pressure thereon;

insulating means for preventing short-circuit between the first and second conducting means through the frame and/or the pressure applying means;

said pressure applying means comprising second spring means for producing, when said pressure applying means are operated, a force acting on said second conducting



means against a force produced by the first spring means for applying pressure on said at least one pile disposed between said first and second surfaces of the first and second conducting means;

said pressure applying means also comprising means for continuing to apply pressure on said at least one pile through the second conducting means after said second spring means are inhibited or completely compressed up to a relatively high pressure;

whereby, in operation, an accurate adjustment within a range of light pressures, starting from a substantially zero pressure, applied on said at least one pile is enabled due to the reverse forces produced by said first and second spring means for enabling accurate adjustment of said electrical resistance of said at least one pile within a range of resistive values given by said range of light pressures, so as to enable to accurately adjust within said range of resistive values an electrical resistance of a series-circuit formed by the first conducting means, said at least one pile, and the second conducting means;

and whereby, in operation, the pressure applied on said at least one pile can be accurately varied within a range extending from said substantially zero pressure to said relatively high pressure so as to enable an accurate adjustment of the electrical resistance of said at least one pile within a wide range, for thereby accurately varying within this wide range the electrical resistance of said series circuit.

4,613,823

MULTI-STAGE SIGNAL TRANSMITTING SYSTEM

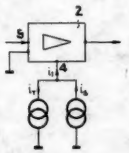
Heinz Rinderle, and Martin Siegle, both of Heilbronn, Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 637,032

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329663

Int. Cl.[4] H03F *3/04;* H03G *3/10*

U.S. Cl. 330—289 9 Claims



1. In a multi-stage signal transmitting system including an amplifier stage whose amplification is electronically adjustable, said amplifier stage having control input means for receiving a control signal for electronically adjusting the amplification of the amplifier stage, and wherein undesired temperature influence on amplification is compensated, the improvement comprising: means connected to said control input means for producing a control signal, which includes an amplification component, for setting the amplification of said amplifier stage and further including temperature compensation means connected to said control input means for effecting temperature variation compensation via said amplifier stage independently of the setting of the amplification of said amplifier stage.

4,613,824

SELECTIVE AMPLIFIER HAVING COMMON BASE CONNECTED TRANSISTOR AND INDUCTIVE INPUT SIGNAL COUPLING

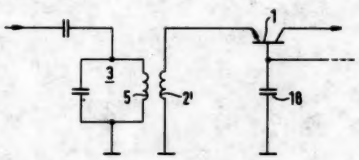
Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Nov. 14, 1984, Ser. No. 671,424

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345496

Int. Cl.[4] H03F *3/191*

U.S. Cl. 330—302 7 Claims



1. A selective amplifier stage comprising: a tunable frequency-selective input filter having a filter coil; an amplifier transistor having an input impedance; and coupling means inductively coupling the amplifier transistor to the input filter, the input filter and the coupling means having a source impedance measured across the coupling means, wherein the input impedance of the amplifier transistor is smaller than the source impedance controlling it at the operating frequency, wherein said inductive coupling means comprise a coupling coil which is magnetically coupled to the filter coil, wherein the coupling coil is of such dimensions that when the input filter is aligned to maximum amplification of the stage, the source impedance driving the amplifier transistor is greater than the input impedance of the amplifier transistor, and wherein tuning of the input filter causes the source impedance to vary with tuning frequency and said coupling coil is given an inductance and the coupling factor between said coupling coil and filter coil is selected for causing the source impedance to have a minimum value when said input filter is tuned to the operating frequency.

4,613,825

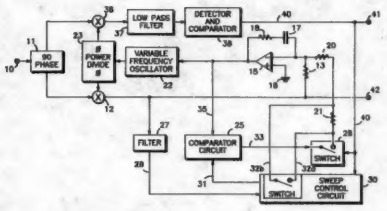
RAPID ACQUISITION, TRACKING PLL WITH FAST AND SLOW SWEEP SPEEDS

Robert H. Bickley, Scottsdale, and Christopher D. Broughton, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1984, Ser. No. 684,222

Int. Cl.[4] H03L *7/06*

U.S. Cl. 331—4 16 Claims



1. A tracking phase locked loop circuit for locking to an incoming signal exhibiting an incoming frequency, said circuit comprising:

a mixer having first and second inputs and a mixer output, said mixer first input being responsive to the incoming signal;

a variable frequency oscillator having a control input and an oscillator output, the oscillator output being coupled to the second input of said mixer and providing a variable frequency signal;

a multirate ramp generator having an output coupled to the control input of said oscillator, said ramp generator for generating a ramp signal having faster and slower sweep rates independently controlled relative to increasing and decreasing sweep directions;

a filter having an input coupled to the output of said mixer and having a filter output, said filter exhibiting a cutoff frequency; and

a sweep control circuit having an input coupled to the filter output and being coupled to said ramp generator, said sweep control circuit being configured to select the faster sweep rate of said ramp generator when the variable frequency of said variable frequency oscillator is less than the incoming frequency minus the cutoff frequency of said filter.

4,613,826

FREQUENCY SYNTHESIZER FOR CATV TUNER

Akinori Masuko, Kawasaki; Wataru Kuroiwa, Fukaya; Yasufumi Shimizu, Fukaya, and Hideki Hirosawa, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 3, 1985, Ser. No. 729,986

Int. Cl.[4] H03L *7/06;* H04K *1/02*

U.S. Cl. 331—14 9 Claims

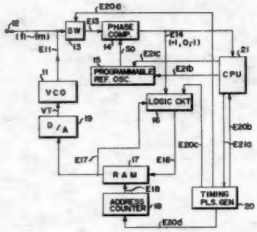
1. A variable frequency oscillator comprising:

memory means for storing a frequncy setting data and providing a frequency control data;

voltage controlled oscillator means coupled to said memory means for providing an oscillation output whose frequency is defined by the contents of said frequency control data;

reference signal means for providing a reference signal having a given frequency and phase;

phase comparator means coupled to said voltage controlled oscillator means and to said reference signal means for detecting the phase difference between said reference signal and a comparison signal corresponding to said oscillation output and for providing a phase data whose contents indicate a first value if the phase of said comparison signal is delayed from the phase of said reference signal, indicate a second value if the phase of said comparison signal is advanced to the phase of said reference signal, and indicate a third value if the phase of said comparison signal matches with the phase of said reference signal;



logic means coupled to said phase comparator means and to said memory means for correcting said frequency control data according to said phase data and for replacing said frequency setting data with the corrected frequency control data; and

signal selection means coupled to said voltage controlled oscillator means and to said phase comparator means for selecting a specific frequency component of said oscillation output to provide said comparison signal, said signal selection means including heterodyne means being responsive to an input signal for providing said comparison signal whose frequency is equal to the frequency difference between said input signal and said oscillation output.

4,613,827

WRITE CLOCK PULSE GENERATOR USED FOR A TIME BASE CORRECTOR

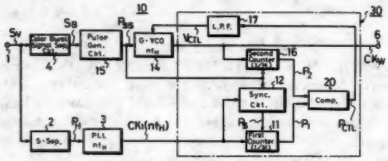
Tsutomu Takamori; Yoshiyuki Nakamura, and Hitoshi Abe, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,341

Claims priority, application Japan, Jul. 28, 1984, 59-115642[U]

Int. Cl.⁴ H03L *7/08*; H04N *5/93*

U.S. Cl. 331—20 **4 Claims**



1. A write clock pulse generator for a time base corrector having a phase locked oscillator responsive to a horizontal synchronizing pulse derived from a reproduced video signal for generating a first clock pulse having a time axis change same as that of said horizontal synchronizing pulse, a frequency of said first clock pulse being n times (n is an integer) the frequency of said horizontal synchronizing pulse, a burst signal separating circuit for separating a color burst signal from said reproduced video signal, and a generating circuit responsive to said first clock pulse and said separated color burst signal for generating a write clock pulse, the phase and frequency of which are locked to those of said separated color burst signal and said horizontal synchronizing pulse, respectively comprising:

(a) a pulse signal generator responsive to said color burst signal for generating a control pulse signal having a pulse width corresponding to a predetermined wave length of said color burst signal, said control pulse signal being in phase with said color burst signal;

(b) a start-stop oscillator responsive to generation of said control pulse signal for generating a second clock pulse the phase of which is in phase with said control pulse signal;

(c) first and second frequency dividers connected to said phase locked oscillator and said start-stop oscillator and for frequency-dividing said first and second clock pulses;

(d) a synchronous circuit responsive to generation of said control pulse for synchronizing dividing operations of said first and second frequency dividers;

(e) a comparator for comparing pulse widths of output pulses of said first and second frequency dividers; and

(f) a control circuit responsive to an output signal of said comparator for controlling a frequency of said start-stop oscillator.

4,613,828

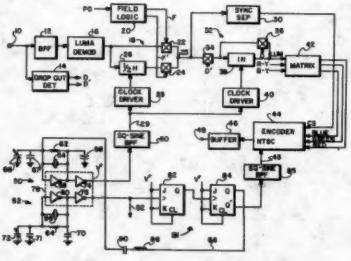
INJECTION-LOCKED VIDEO FREQUENCY OSCILLATOR

Robert P. Collette, Pavilion, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 25, 1985, Ser. No. 748,810

Int. Cl.⁴ H03B *1/04*

U.S. Cl. 331—47 **13 Claims**



1. A video circuit that generates several frequency signals for such use during the processing of a video signal that the frequency signals appear in the frequency spectrum of the output video signal, said video circuit comprising:

first crystal-controlled oscillator means for generating a first frequency signal;

second crystal-controlled oscillator means for generating a second frequency signal that is nominally a multiple of the frequency of said first frequency signal; and

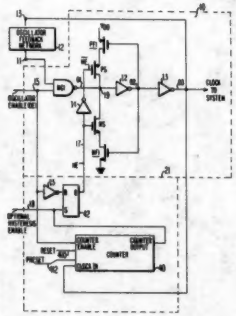
feedback means responsive to said first frequency signal for locking the oscillation frequency of said second oscillator means to variations of a corresponding harmonic component of said first frequency signal.

4,613,829

SWITCHABLE OSCILLATOR CIRCUIT

Russell G. Ott, Cranford Township, Union County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1985, Ser. No. 793,237
Int. Cl.[4] H03B 5/00
U.S. Cl. 331—59 8 Claims



1. An oscillator circuit comprising:

first and second oscillator terminals for the connection therebetween of different types of oscillator feedback networks;

selectively enabled amplifying means having an input connected to said first oscillator terminal and having an output connected to said second oscillator terminal;

selectively enabled hysteresis producing feedback means connected to said amplifying means for, when enabled, causing said amplifying means to exhibit hysteresis;

oscillator enabling means connected to said amplifying means for selectively enabling said amplifying means and causing oscillation within the circuit loop formed by said amplifying means and said oscillator feedback network; and

means responsive to said oscillator enabling means, coupled to said hysteresis producing feedback means, for delaying the enabling of said hysteresis producing feedback network, after said amplifying means is enabled, for a predetermined number of oscillations, depending on the type of oscillator feedback network connected between said oscillator terminals.

4,613,830

PROXIMITY SWITCH HAVING VARIABLE GAIN OSCILLATOR

Fumio Kamiya, Nagaokakyo; Hisatoshi Nodera, Kusatsu; Kenji Ueda, Otsu; Keinosuke Imazu, Takatsuki, and Hidehiro Tomioka, Kyoto, all of Japan, assignors to Omron Tateisi Electronics, Co., Kyoto, Japan

Filed Jul. 29, 1985, Ser. No. 759,981
Claims priority, application Japan, Jul. 27, 1984, 59-157915; Jul. 27, 1984, 59-157916
Int. Cl.[4] G01V 3/11; H03B 5/12
U.S. Cl. 331—65 7 Claims

1. A proximity switch of high frequency oscillation type having an oscillation circuit and a detector circuit which detects an object from reduction in oscillation output, characterized in that:

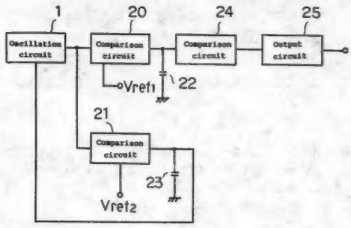
the oscillation circuit is an oscillation circuit which increases its oscillation gain according to an output from an external source;

the proximity switch further comprising:

a first rectifying circuit which rectifies the output of the oscillation circuit and smoothes the output according to a certain time constant;

a second rectifying circuit which rectifies the output of the oscillation circuit and smoothes the output according to a time constant smaller than the mentioned time constant to give an oscillation gain control signal to the oscillation circuit; and

a comparison circuit which detects the reduction in the output of the first rectifying circuit by comparing the



output thereof with a certain reference level and produces an object detection signal;

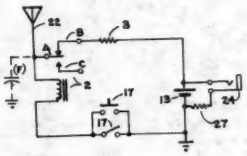
whereby the oscillation circuit being capable of increasing its gain according to the reduction in the oscillation gain.

4,613,831

AUDIO, ULTRASONIC AND RF NOISE GENERATOR FOR DEMONSTRATION OF ELECTRICAL INTERFERENCE

Marvin O. Loftness, 115 W. 20th Ave., Olympia, Wash. 98501

Filed Oct. 16, 1985, Ser. No. 788,026
Int. Cl.[4] H03B 29/00; H01J 1/00
U.S. Cl. 331—78 14 Claims



1. An audio, ultrasonic and radio frequency (RF) generator including:

a. an enclosure,

b. a sparking noise module within the enclosure which simultaneously emits low-level audio, ultrasonic, and RF medium frequency (MF), high frequency (HF), very high frequency (VHF), and ultra high frequency (UHF) radiations,

c. a low-voltage battery power supply,

d. an RF-radiating antenna located on the enclosure,

e. a diaphragm on the enclosure for transmitting said audio and ultrasonic radiations,

f. a switch on the enclosure for activating the noise generator.

4,613,832

FLUID FILLED MICROWAVE CAVITY OSCILLATOR FOR A DISCONTINUITY DETECTOR SYSTEM

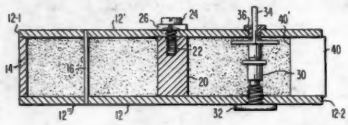
Daniel D. Mawhinney, Livingston, and Henry F. Milgazo, Brick, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 6, 1985, Ser. No. 795,503
Int. Cl.[4] H03B 7/12
U.S. Cl. 331—96 5 Claims

1. A microwave cavity oscillator comprising, in combination:

a section of hollow waveguide, having first and second ends;

an active device positioned in the waveguide;
means for closing off said first and second ends; and



a fluid with a dielectric constant which is high compared to that of air filling the entire waveguide and surrounding and touching said active device.

4,613,833

TRANSMISSION CHANNEL COUPLER FOR ANTENNA

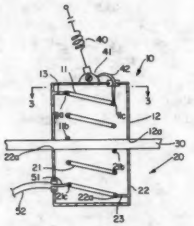
Takuji Harada, Hiratsuka, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,827

Claims priority, application Japan, Dec. 30, 1984, 59-280845

Int. Cl.[4] H01P *5/02, 7/00;* **H01Q** *1/27*

U.S. Cl. 333—24 R **15 Claims**



1. A transmission channel coupler for a VHF or UHF antenna for coupling electromagnetic energy through an insulated material comprising:

an ungrounded outer conductor having first and second ends; and

a helical conductor having first and second ends provided within and substantially coaxial with said outer conductor, said first and of said helical conductor being electrically connected to a point on an inner wall of said outer conductor which is adjacent said first end of said outer conductor, said helical conductor and said outer conductor being arranged and configured such that a ratio of an inside diameter of the outer conductor to an outside diameter of said helical conductor 1.1–2.0.

4,613,834

MICROWAVE SLOT LINE RING HYBRID HAVING ARMS WHICH ARE HF COUPLED TO THE SLOT LINE RING

Wilfried Heine, Backnang, Fed. Rep. of Germany, assignor to Ant Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,722

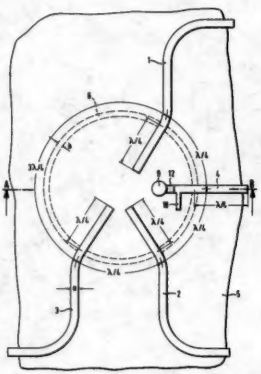
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248641

Int. Cl.[4] H01P *5/22*

U.S. Cl. 333—120 **18 Claims**

1. A microwave ring hybrid comprising:

a dielectric carrier substrate; a conductive layer disposed on one major surface of said substrate; a ring for said hybrid including an annular closed slot line formed by an annular slot in said conductive layer; and a plurality of connecting arms of said hybrid, with each of said connecting arms being a microstrip line including a conductor disposed on the opposite major surface of said carrier substrate such that said conductors crossover said annular slot line in a direction substantially perpendicular to the circumference of said slot line and are coupled with said slot line in the region of said crossovers; and



wherein said conductors of said microstrip lines of at least two of said connecting arms extend from said slot line into the region enclosed by said slot line by a section of a length of $\lambda/4$, where λ is the wavelength of the center frequency of the hybrid in the respective said microstrip line.

4,613,835

REFLECTION PHASE SHIFTER

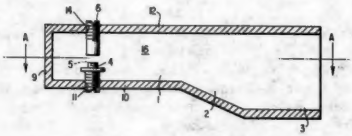
Rainer Geissler, Niederdorfelden, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,750

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415674

Int. Cl.[4] H01P *1/18*

U.S. Cl. 333—159 **6 Claims**



1. A reflection phase shifter connectable to a waveguide for shifting the phase of a high frequency signal received from the waveguide wherein the waveguide has height and width dimensions, said phase shifter comprising:

a waveguide section having two pairs of opposite side walls and an end wall forming a short-circuit, said side walls defining a cavity and an opening opposite to said end wall for communication with the waveguide, said waveguide section having a broad dimension between one pair of opposite side walls corresponding to the width dimension of the waveguide and a narrow dimension between the other pair of opposite side walls which is smaller than the height dimension of the waveguide;

a switchable semiconductor arrangement, including a switching semiconductor element and a housing for accommodating said switching semiconductor element, adjustably mounted in a side wall of said waveguide sec-

tion and penetrating into said cavity with a controllable penetration depth for tuning said waveguide section for a desired phase angle shift; and

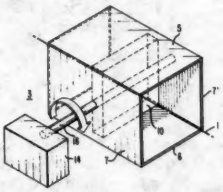
a tuning pin mounted in a side wall of said waveguide section so that said tuning pin is disposed opposite said switchable semiconductor arrangement.

4,613,836

DEVICE FOR SWITCHING BETWEEN LINEAR AND CIRCULAR POLARIZATION USING ROTATION IN AN AXIS ACROSS A SQUARE WAVEGUIDE

Gary E. Evans, Trappe, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,334
Int. Cl.[4] H01P *1/18, 1/17*
U.S. Cl. 333—159 **8 Claims**



1. A microwave phase shifting device comprising:

a metal waveguide means having a longitudinal axis, said waveguide means comprising a hollow elongated conductive enclosure, said waveguide means operable to transmit a high frequency microwave signal of either circular or linear polarization, a shaft means passing through said waveguide wall, said shaft means perpendicular to said longitudinal axis of said waveguide and said shaft means is of sufficient length to be accessible from outside of said waveguide and said shaft means is operable to rotate in a clockwise or counterclockwise direction while extended into said waveguide rotatable about an axis transverse to said longitudinal axis of said waveguide;

a slab of dielectric material having a predetermined dielectric constant and predetermined length, said slab operable to permit said shaft to attach to, and support said slab of dielectric material, said slab further operable to rotate laterally upon said shaft means within said waveguide means perpendicular to said longitudinal axis of said waveguide means and via said lateral rotation of said dielectric slab means achieves a differential phase shift of the orthogonal fields of said microwave signal, and;

a shaft rotation means located outside of said waveguide means connected to said shaft means and operable to achieve the clockwise or counterclockwise rotation of said shaft means and ultimately the lateral rotation of said dielectric means achieving a differential phase shift of said microwave signal.

4,613,837

MULTIPLE FEED RF COILS

Judd Blass, Petuach, and Hanan Keren, Saba, both of Israel, assignors to Elscint, Ltd., Haifa, Israel

Filed Nov. 7, 1984, Ser. No. 668,944
Int. Cl.[4] H01P *7/00;* **G01V** *3/14*
U.S. Cl. 333—219 **11 Claims**

1. A radio frequency (RF) coil of improved efficiency for magnetic resonant imaging (MRI) systems, said coil comprising:

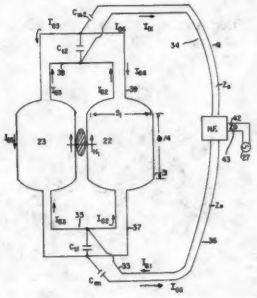
(a) loop means for generating magnetic fields transverse to a subject responsive to variations in the current therethrough;

(b) said loop means comprising at least one conductor turn on each side of said subject;

(c) each of said at least one conductor turn being divided into first and second locations substantially opposite to each other;

(d) electromotive force (EMF) means for causing current to flow; and

(e) coupling means for coupling said EMF means to said first and second section to cause current to flow in the same



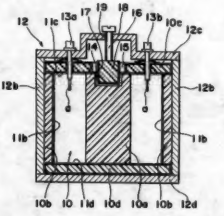
direction in said first and second sections of each of said at least one conductor turn and in the same direction in both of said at least one conductor turn whereby the magnetic fields generated by each of sections are additive while the length from the instantaneous positive to negative polarities of the EMF means is reduced by a factor of two relative to turns that are not divided into said sections.

4,613,838

DIELECTRIC RESONATOR

Hidekazu Wada, Kobe, and Youhei Ishikawa, Kyoto, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 29, 1985, Ser. No. 770,839
Claims priority, application Japan, Aug. 31, 1984, 59-183204
Int. Cl.[4] H01P *7/10, 7/06*
U.S. Cl. 333—232 **15 Claims**



1. A dielectric resonator employing TM_{010} mode or variation mode thereof, comprising

a support,

a cavity resonator adjacent said support,

a columnar inner dielectric member substantially concentrically accommodated within said cavity resonator, said dielectric member having end faces contacting respective interior surfaces of said cavity resonator, and said cavity resonator having an opening formed therein adjacent one of said end faces to provide a region at said one end face of said inner dielectric member which is out of contact with said cavity resonator, and

a resonant frequency adjusting member mounted on said support and adapted to be movable toward or away from said region, to adjust the resonant frequency of said dielectric resonator through variation of a capacitance value in an electric field path passing through said columnar di-

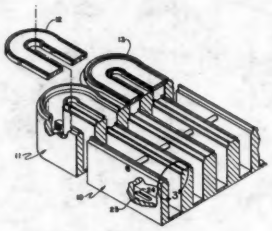
electric member, said resonant frequency adjusting member, and said cavity resonator.

4,613,839

MACHINED WAVEGUIDE

John D. Foglesonger, Los Angeles, and Robert A. Masters, Agoura, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 9, 1984, Ser. No. 639,160
Int. Cl.[4] H01P *3/12, 5/18*
U.S. Cl. 333—239 **3 Claims**



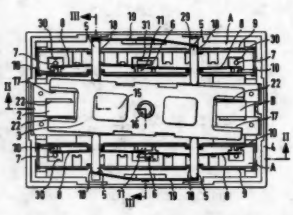
1. A machined planar waveguide comprising: a planar body machined vertically with a serpentine waveguide path of rectangular U-shaped cross section wherein said waveguide path cross section has two vertical legs and a transverse bight portion, said vertical legs having vertical notches machined on inside edges of said vertical legs and a cover plate nesting in said vertical notches, and arc welds on each side thereof to said notched body enclosing a gas tight space therewith of a rectangular cross section.

4,613,840

RELAY FOR HIGH-FREQUENCY CIRCUITS

Hisao Yabu; Kenji Tsuji, and Akinori Hirabayashi, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,600
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—128 **12 Claims**



1. An electromagnetic relay for use in a high-frequency circuit, comprising

a coil,

an armature block mounted for pivotal movement between two switching positions by energization of said coil,

a pair of contact systems disposed on opposite sides of said armature block, each contact system being surrounded by electrically conductive shield means and including a first fixed contact disposed in said high-frequency circuit, a second fixed contact connected to said shield means, and a movable contact, and

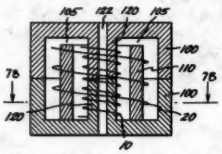
actuator means linking said movable contacts to said armature block for causing engagement between each movable contact and the associated first and second fixed contact, respectively, in either switching position of said armature block.

4,613,841

INTEGRATED TRANSFORMER AND INDUCTOR

Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 556,503, Nov. 30, 1983, abandoned, which is a continuation of Ser. No. 292,322, Aug. 12, 1981, abandoned. This application Apr. 15, 1985, Ser. No. 723,020
Int. Cl.[4] H01F *17/06*
U.S. Cl. 336—83 **6 Claims**



1. An electrical transformer comprising:

a substantially closed hollow and substantially cylindrical form comprising high permeability magnetic material, said form being divided in the axial direction into two cup-shaped pieces having a flat bottom portion and rounded sides;

high permeability opposing projections extending inward from each of the flat portions of said forms, said projections abutting to form a closed magnetic circuit;

a primary electrical winding disposed about at least one of said projections;

a secondary electrical winding disposed about at least one of said projections; and

magnetic shunt means internal to said cylindrical form and disposed between said primary electrical winding and said secondary electrical winding for providing a lower permeability magnetic circuit shunt path, said magnetic shunt means comprising an internal cylindrical shell disposed about said projections and extending between said flat form portion.

4,613,842

IRON CORE FOR ELECTRICAL MACHINERY AND APPARATUS AS WELL AS METHOD FOR PRODUCING THE IRON CORE

Tadashi Ichiyama, Sagamihara; Shigehiro Yamaguchi, Fujisawa; Tohru Iuchi, Kawasaki, and Yoshihiro Ohya, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Japan

Continuation of Ser. No. 197,133, Oct. 15, 1980, abandoned. This application May 31, 1984, Ser. No. 615,871
Claims priority, application Japan, Oct. 19, 1979, 54-134237; Dec. 11, 1979, 54-160501; Dec. 11, 1979, 54-160502; Jan. 25, 1980, 55-7477
Int. Cl.[4] H01F *27/24*
U.S. Cl. 336—218 **22 Claims**

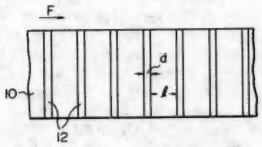
1. An AC electrical apparatus magnetic core lamination component comprising:

at least a first and a second magnetic portion angularly interrelated with each other in series so as to jointly conduct an AC magnetic flux in their respective longitudinal directions and which are integrally blanked from a (110)[001] crystal grain-oriented electromagnetic steel sheet;

said first magnetic portion having said longitudinal direction generally parallel to the direction of the [001] axis of the crystal grains and having patterns of marks of laser beam irradiation thereon only generally perpendicular to said direction of the [001] axis of the crystal grains for conduct-

ing said megnetic flux generally parallel to said direction of the [001] axis of the crystal grains; and

said second magnetic portion having said longitudinal direction generally perpendicular to the direction of the [001]



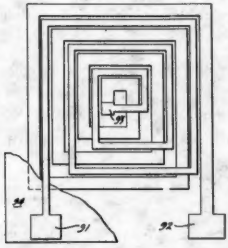
axis of the crystal grains and having patterns of marks of laser beam irradiation thereon only generally parallel to said direction of the [001] axis of the crystal grains for conducting said magnetic flux generally perpendicular to said direction of the [001] axis of the crystal grains.

4,613,843

PLANAR COIL MAGNETIC TRANSDUCER

Michael J. Esper, Farmington Hills; Russell J. Haeberle, Plymouth, and Brian G. Winegar, Howell, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 22, 1984, Ser. No. 663,523
Int. Cl.[4] H01F *27/28;* G01B *7/14*
U.S. Cl. 336—232 **2 Claims**



1. A magnetic transducer comprising:

a generally planar high resistivity substrate having a first major planar surface and an opposing second major planar surface;

a generally planar first coil having one side secured to said first major planar surface of said substrate;

a magnet positioned adjacent said second surface on the opposite side of said substrate from said generally planar first coil;

said planar first coil including an inwardly winding conductive path from an outside connection terminal to an inside connection terminal;

said first coil being copper formed on chromium;

said substrate being formed of a ceramic material;

said conductive path being formed of a plurality of connected conductive runs, each conductive run having a generally rectangular boundary and successively nested within one another, each conductive run having a width of about 5 microns, a spacing of about 5 microns, from an adjacent coil conductive run, and a height in the range of about 1 to 3 microns;

a non-conducting passivating layer formed on said planar first coil;

a generally planar second conductive coil having one side secured to said passivating layer on the side opposite from said first coil;

a conductive interconnection extending through said passivating layer between said first and second coils; and

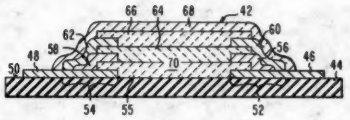
said second conductive coil being formed of a plurality of connected conductive runs, each conductive run having a generally rectangular boundary and successively nested within one another.

4,613,844

HIGH POWER RF THICK FILM RESISTOR AND METHOD FOR THE MANUFACTURE THEREOF

Edward J. Kent; Dorris F. Lore, both of Marlton, and Eugene J. Viereck, Jr., Gloucester, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 26, 1985, Ser. No. 769,145
Int. Cl.[4] H01C *1/012, 1/01, 17/00*
U.S. Cl. 338—314 **6 Claims**



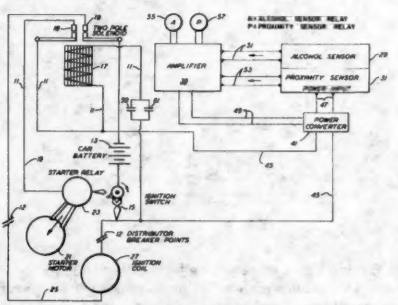
1. In a thick film resistor having (a) an electrically insulative thermally conductive substrate; (b) a pair of opposed spaced apart terminals attached to a surface of the substrate with each of said terminals including a primary contact portion; and (c) a resistor body extending between the terminals and being electrically connected with the respective primary contact portion of each terminal, and being formed of a plurality of overlying layers of a resistor material with the adjacent layers thereof in electrical contact; the improvement which comprises: each of said terminals further including a plurality of spaced apart elongated secondary contact portions in electrical and heat transferring connection with the primary contact portion of the respective terminals and being interleaved between the layers of said resistive material and extending partially into the resistor body.

4,613,845

APPARATUS FOR PREVENTING OPERATION OF MACHINERY BY ONE WHO IS INTOXICATED

Donald E. Du Bois, Rte. 28, Shokan, N.Y. 12481

Filed Mar. 24, 1983, Ser. No. 478,357
Int. Cl.[4] B60Q *1/00;* G08B *23/00*
U.S. Cl. 340—52 R **2 Claims**



1. An apparatus for preventing the operation of machinery, such as a motor vehicle, by an intoxicated operator, the machinery having a control panel where the operator is situated when operating the machinery and having an electrical power

source for actuating the machinery, such apparatus comprising:

an alcohol sensor located in the vicinity of said control panel, said alcohol sensor including means for detecting the state of intoxication of the operator from the operator's breath and a proximity sensor to detect any object obstructing access to the alcohol sensor, said alcohol sensor and said proximity sensor being connected to the power source of the machinery;

an amplifier connected to said alcohol sensor and to said proximity sensor, said alcohol sensor being adapted to transmit an alcohol sensor electrical impulse when activated and said proximity sensor being adapted to transmit a proximity sensor electrical impulse when activated, said alcohol sensor being electrically connected to said amplifier to transmit the alcohol sensor electrical impulse to said amplifier, said proximity sensor being electrically connected to said amplifier to transmit the proximity sensor electrical impulse to said amplifier, said amplifier being connected to the power source;

an alcohol sensor relay and a proximity sensor relay, each relay being connected to said amplifier, said alcohol sensor relay being actuated by said alcohol sensor through said amplifier and said proximity sensor relay being actuated by said proximity sensor through said amplifier, said alcohol sensor relay including an alcohol sensor contact and said proximity sensor relay including a proximity sensor contact, said alcohol sensor contact and said proximity sensor contact each being normally open and being connected in parallel with one another;

a power converting means for converting direct current to alternating current, said power source being connected to said alcohol sensor and said proximity sensor and to said amplifier through said power converting means; and

an electrical circuit opening means which is normally closed and which is electrically connected in series with said power source, said alcohol sensor contact and said proximity sensor contact being electrically connected to said electrical circuit opening means, said electrical circuit opening means being opened when said alcohol relay is energized, said electrical circuit opening means being opened when said proximity relay is energized.

4,613,846

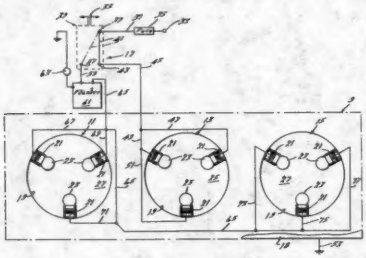
LIGHT SYSTEM FOR TRUCKS

Gerald M. Groves, 1311 Spruce, Southgate, Mich. 48195

Filed Jun. 6, 1983, Ser. No. 501,096

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—106 **1 Claim**



1. A passing signal system for a highway vehicle to obviate the need for flashing high beam headlights to tell a passing driver it is safe to complete passing comprising;

a panel adapted to be attached to the front end of said highway vehicle,

said panel having recesses to receive three light units,

a first light unit having an amber lens,

a second and third light unit having green lenses,

each said light unit having a plurality of bulbs wired in parallel,

circuit means for connection to the electrical system of the vehicle and including means to operate said light units when the vehicle ignition system is "on",

a flasher in said circuit means connected to said bulbs of said second light unit and said bulbs of said third light unit to flash said bulbs of said second light unit and said bulbs of said third light unit when energized,

a driver operated switch in said circuit means which alternatively energizes either said bulbs of said first light unit to inform passing drivers that said system exists and is energized or said flasher to flash said bulbs of said second light unit and said bulbs of said third light unit to inform passing drivers that there is a clear condition to complete passing of said highway vehicles and a signal having an audio and/or visual output in said circuit means energized by current flow to the flasher to indicate to the driver by such output that there is current flow to the flasher.

4,613,847

EMERGENCY SIGNAL

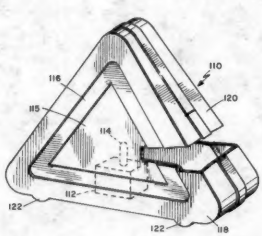
John E. Scolari, La Mesa; Robert T. Warner, Poway, and Joe E. Deavenport, San Diego, all of Calif., assignors to Life Light Systems, San Diego, Calif.

Continuation-in-part of Ser. No. 521,276, Aug. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 466,326, Feb. 14, 1983, Pat. No. 4,489,306, which is a continuation of Ser. No. 318,499, Nov. 5, 1981, abandoned. This application Jul. 23, 1984, Ser. No. 632,308

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—114 R **111 Claims**



91. An emergency signal comprising:

a housing formed with at least two triangular surfaces;

light transmissive window means in at least one of said surfaces;

means for supporting said housing on a substantially flat surface;

a high intensity lamp within said housing positioned so as to be visible through said window means;

lamp control means mounted in said housing.

4,613,848

MULTIPLE-ZONE INTRUSION DETECTION SYSTEM

Randy W. Watkins, Sun Valley, Calif., assignor to Teletron Security, Inc., Tujunga, Calif.

Filed Nov. 29, 1984, Ser. No. 676,473

Int. Cl.[4] G08B *13/00, 25/00*

U.S. Cl. 340—541 **21 Claims**

1. A multiple-zone intrusion detection system comprising:

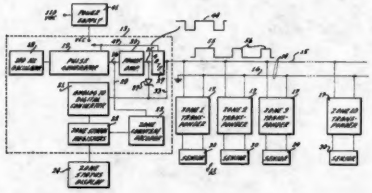
a central controller;

a plurality of remote zone transponders;

a two-wire communication cable interconnecting said central controller and said plurality of zone transponders;

said central controller including pulse generating means for

applying address pulses on said communication cable for supplying power to and sequentially addressing said zone transponders thereby causing each of said zone transponders to transmit an analog signal on said communication cable back to said central controller; and



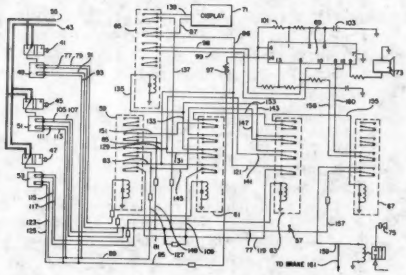
an analog-to-digital converter at said central controller for converting said analog signal to a digital signal indicative of the status of an addressed zone transponder.

4,613,849

INTERFERENCE WARNING DEVICE

Roger Smith, Jr., Georgetown; Joseph R. Priest, Austin; Faustyn C. Langowski, Georgetown, and Harry D. Hebard, Round Rock, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Apr. 23, 1984, Ser. No. 603,258
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—679 **5 Claims**



1. An interference warning device for an oil well drilling rig having a derrick, traveling equipment, a racker arm, and a block retractor, comprising:

traveling equipment sensing means for providing a signal when the traveling equipment is within a selected vertical distance from the racker arm;

racker arm sensing means for providing a signal when the racker arm is within a selected horizontal distance from the vertical axis of the derrick;

block retractor sensing means for providing a signal when the block retractor has extended the traveling equipment to within a selected distance from the fully extended position;

information means for informing an operator when any one of the sensing means provides a signal;

caution means for cautioning the operator when any two of the sensing means provide signals; and

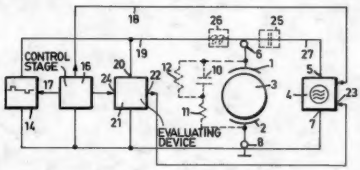
warning means for warning the operator when all three of the sensing means provide signals.

4,613,850

CIRCUIT ARRANGEMENT FOR CHECKING THE POSITION OF ELECTRODES

Hartwig Timmermann, Hamburg, Fed. Rep. of Germany, assignor to Medel Medizinische Elektronik Handelsges. mbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 632,711
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346744
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—686 **13 Claims**



1. A circuit arrangement adapted for checking the position of electrodes on an object, comprising in combination

a treatment generator for periodically supplying treatment energy and periodically supplying a test impulse independent of said treatment energy to the electrodes, and wherein a transfer impedance of a certain magnitude exists between said electrodes, a voltage being developed across, and a current flowing through said transfer impedance as a result of said test impulse,

evaluating means for evaluating the magnitude of said transfer impedance, including test circuit means connected to said electrodes for accepting at least one of said voltage and current developed across, and flowing through said transfer impedance, respectively, and

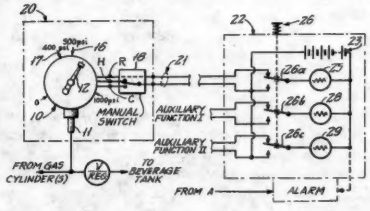
warning signal means for emitting a warning signal upon the magnitude of said transfer impedance exceeding or dropping below respective predetermined upper and lower limit values.

4,613,851

REMOTE PRESSURE-INDICATING MEANS

James H. Hines, Vernon, N.J., assignor to Tap-Rite Products Corp., Hackensack, N.J.

Filed Oct. 23, 1984, Ser. No. 664,007
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—688 **10 Claims**



1. As an article of manufacture, a fluid-presure-responsive gage having a housing with a circular indicator face of magnetically transparent material, an indicator needle centrally mounted for sweeping rotary motion over an arcuate range of pressure indications on said face, a permanent-magnet element carried by said needle for sweeping movement with said needle, first and second magnetic-reed switch units fixedly mounted within said housing behind said face and positioned for independent magnetic-coaction with said needle magnet at each of two discrete levels of pressure indication within said

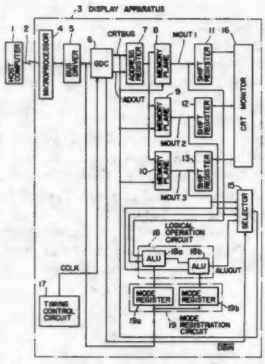
range, and means accessible externally of said housing for external circuit connection of said switch units, one of said switch units being positioned to change its state for a predetermined lower limit of safe fluid pressure for the condition that a connected source of fluid pressure is in a refrigerated environment and the other of said switch units being positioned to change its state for a predetermined lower limit of safe fluid pressure for the condition that the connected source of fluid pressure is in a room-temperature environment.

4,613,852

DISPLAY APPARATUS

Kinya Maruko, Oume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 27, 1983, Ser. No. 546,041
Claims priority, application Japan, Oct. 29, 1982, 57-190309
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—703 **5 Claims**



1. Display apparatus comprising:

a plurality of memory planes for storing data for display,

graphic display control means for writing data in and reading data out from the memory planes,

a data processing unit for controlling the memory planes and the graphic display control means,

a system bus for connecting the data processing unit and the graphic display control means,

a display bus for connecting the graphic display control means and the memory planes,

mode registration means for latching a plurality of different modes of operation, said modes being designated by the data processing unit, wherein an instruction for the designation is supplied through the system bus,

a logical operation circuit capable of performing a plurality of different logical operations, each mode of operation being associated with one of said plurality of different logical operations,

wherein the logical operation circuit performs one of said logical operations on the data read from the memory planes in accordance with the mode latched in the mode registration means, and

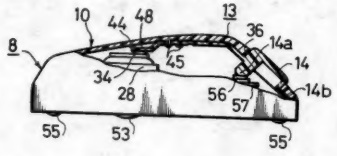
means for receiving data outputted from the logical operation circuit, and supplying said received data to the display bus in accordance with a control signal from said data processing unit.

4,613,853

X-Y INPUT DEVICE

Junichi Hosogoe; Yuichi Ida, and Motoyuki Suzuki, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 16, 1984, Ser. No. 630,944
Claims priority, application Japan, Jul. 14, 1983, 58-108263[U]
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **6 Claims**



1. An X-Y input device comprising a casing supporting a rotatable ball extending partially through a lower wall of said casing and means including first and second driven rollers held against said rotatable ball with their axes of rotation extending orthogonally, for generating signals corresponding to the X and Y coordinates of the movement of said ball, an annular holder fixedly secured to said casing and having a domed portion extending over and covering the upper portions of said ball and at least one switch lever, formed as an integral piece extending substantailly linearly, having one end portion extending partially through an upper portion of said casing to form an actuation portion, a mid portion extending along and held at one point to the underside of the upper portion of said casing, and its other end portion adjacent said mid portion and held between the underside of the upper portion of said casing and an upper portion of said domed portion.

4,613,854

SYSTEM FOR OPERATING A DOT MATRIX DISPLAY PANEL TO PREVENT CROSSTALK

George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 22, 1983, Ser. No. 524,872
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—714 **13 Claims**

1. A display panel and operating system therefor comprising

a gas-filled display panel including a matrix of D.C. scanning cells arrayed in columns and having scan electrode means for turning on all of the cells of each column sequentially and for selectively turning off one or more scan cells in each column as the column is turned on; and a matrix of display cells adjacent to said matrix of scanning cells, with each scanning cell communicating with a display cell through a small aperture in an electrode plate, and having display electrode means for operation to sustain display glow after glow has been transferred thereto from a scanning cell,

a source of sustaining signals coupled to said display electrode means,

a source of display signals coupled to said scanning electrode means and operable to turn off selected scanning cells in each column of scanning cells as each such column is energized whereby glow is transferred from said selected scanning cells to the associated display cells,

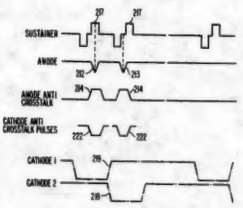
said scan electrode means including an array of row anodes and an array of column cathodes which cross each other and define said scanning cells,

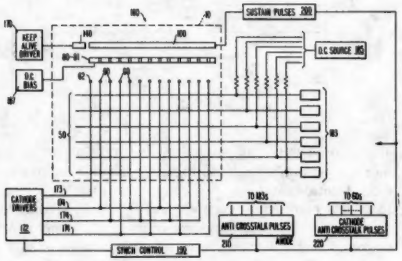
a first source of anti-crosstalk signals coupled to said scan anodes for application of anti-crosstalk signals thereto at the same time that display signals are coupled thereto, and

a second source of anti-crosstalk signals coupled to said scan cathodes for application of anti-crosstalk signals to the

"off" cathodes at the same time that display signals are coupled to the "on" cathodes in a scanning cycle,

scan cathodes which are associated with scan cells which are turned on and glowing being "on" cathodes and scan cathodes which are associated with scan cells which are





not glowing being "off" cathodes, scan cells which are "on" generating excited particles,

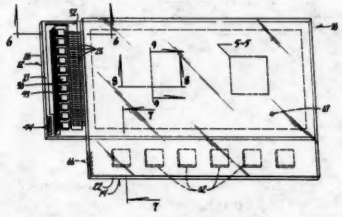
said first and second anti-crosstalk signals serving to focus and retain excited particles at "on" scan cells and thus assist the turn-on of the display cells associated with "on" scan cells.

4,613,855

DIRECT CURRENT DOT MATRIX PLASMA DISPLAY HAVING INTEGRATED DRIVERS

Herman R. Person; Joseph F. Hesse, and Keith T. Raysby, all of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed Mar. 5, 1984, Ser. No. 586,313
Int. Cl.[4] G09G *3/28*
U.S. Cl. 340—718 **11 Claims**



1. A dot matrix plasma display comprising:

a rectangular substrate having opposite end edges, opposite side edges, and an upwardly presented surface,

a rectangular transparent top plate having opposite end edges, opposite side edges, and a downwardly presented surface;

sealing means holding said substrate and said top plate in parallel spaced apart relation to one another, said sealing means forming a continuous seal between said substrate and said top plate so as to define a sealed envelope therebetween;

one of said edges of said substrate extending outwardly beyond said sealing means so as to form a first upwardly facing mounting surface, outside said envelope;

one of said edges of said top plate extending outwardly beyond said sealing means so as to form a second downwardly facing mounting surface outside said envelope;

a plurality of elongated anode strips mounted on said top plate and extending within said envelope in a first direction parallel and spaded apart from one another;

a plurality of elongated cathode strips mounted to said substrate and extending within said envelope in a second direction parallel and spaced apart from one another, said second direction being transverse to said first direction;

cathode driving means for driving said cathode strips, said cathode driving means being attached to and mounted to said fist mounting surface of said substrate and having a plurality of cathode driver pads;

said cathode strips each having an outer end extending from within said envelope to outside said envelope and being connected to at least one of said cathode driver pads;

a plurality of cathode connecting means on said first mounting surface of said substrate, said cathode connecting means each having a first end connected to another of said cathode driver pads and having a second end adapted for connection to outside circuitry;

anode driving means for driving said anode strips, said anode driving means being attached to and mounted to said second mounting surface of said top plate and having a plurality of anode driver pads;

said anode strips each extending from within said envelope to outside said envelope and being connected to one of said anode driver pads;

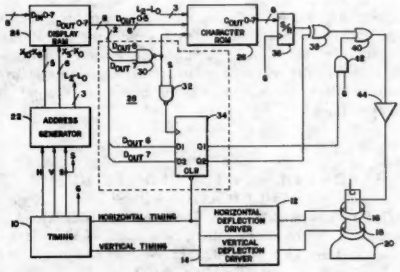
a plurality of anode connecting means on said second mounting surface of said top plate, said anode connecting means each having a first end connected to another of said anode driver pads and having a second end adapted for connection to outside circuitry.

4,613,856

CHARACTER AND VIDEO MODE CONTROL CIRCUIT

Daniel C. Olin, Portland; Russell Y. Anderson, Hillsboro, and Steven C. DenBeste, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 4, 1983, Ser. No. 481,557
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—723 **7 Claims**



1. An electrical circuit comprising:

means for storing a plurality of sets of electrical patterns, each of said electrical patterns representative of character information and each set of electrical patterns defining a

corresponding character set, said storing means coupled to receive a first portion of a coded electrical signal and at least one control signal to produce an output electrical signal representative of character information; and

means for detecting a second portion of said coded electrical signal to produce said at least one control signal coupled to said storing means, said at least one control signal selecting one of said sets of electrical patterns, one of said electrical patterns within said selected one of said sets of electrical patterns being selected by said first portion of said coded electrical signal, and to produce additional control signals representative of character attributes.

4,613,857

REPEATED INFORMATION DETECTION

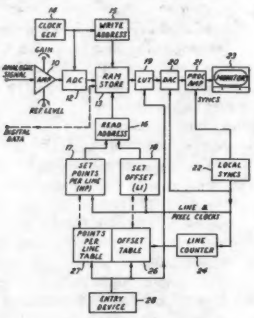
Ian C. Walker, Newbury, England, assignor to Micro Consultants Limited, Surrey, England

Filed Jan. 3, 1984, Ser. No. 568,987

Claims priority, application United Kingdom, Jan. 4, 1983, 8300025

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—724 **12 Claims**



1. A repeated information detection system comprising:

display means for displaying an applied signal in a sequence of lines to form a two dimensional display in which signal elements of different values are represented by different brightnesses of respective line elements, each line being scanned in a line period,

means for storing an incoming signal, so that different signal elements are stored in different locations; and

means for selecting sequences of signal elements from said store for application to said display means during successive line periods so that the selected signal elements applied during different line periods are displayed in proximity to each other,

said selecting means including means for variably offsetting the locations in the store from which the selection of signal elements is made during a line period to allow an operator of the repeated information detection system to search for brightness correlation between different displayed lines.

4,613,858

ERROR ISOLATOR FOR BI-DIRECTIONAL COMMUNICATIONS BUSES

Dale D. Davidson, and David A. Dietz, both of Glendale, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,682

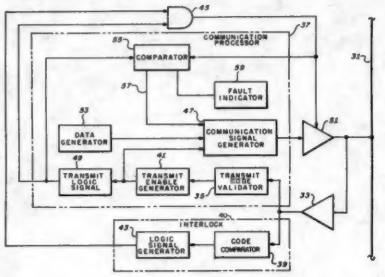
Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.5 **6 Claims**

1. In a communication system of the type having a bus for bi-directional signal propagation, a bus control coupled to the bus for providing signal traffic direction by transmitting a sequence of request to transmit codes, and bus users coupled to the bus, each bus user having a communication signal generator and an assigned request to transmit code which, when received, activates that user to transmit, the improvement in the user comprising:

interlock means responsive to a preselected request to transmit code for generating first logic signals with predetermined time duration;

enabling means responsive to said preselected request to transmit code for providing enabling signals to said communication signal generator;



transmit logic signal means responsive to said enabling signals for generating second logic signals of predetermined time duration; and

gate means coupled to receive said first and second logic signals and to said communication signal generator for coupling said communication signal generator to said bus when said first and second logic signals are simultaneously coupled to said gate means.

4,613,859

PAGER RECEIVER SELECTIVELY CHANGEABLE BETWEEN CALL NUMBER RECEPTION AND MESSAGE RECEPTION

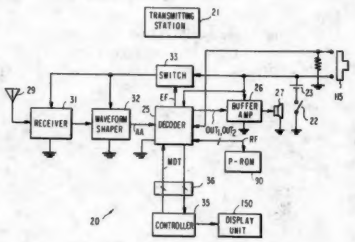
Toshihiro Mori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 18, 1983, Ser. No. 495,875

Claims priority, application Japan, May 31, 1982, 57-80395[U]

Int. Cl.⁴ G08B *5/22*

U.S. Cl. 340—825.44 **4 Claims**



1. A paper receiver for use in a paging system performing a call tone service and a display service by the use of call number signals common to said call tone service and said display service, said pager receiver is operable in response to a preassigned one of said call number signals to produce a call indication signal indicating that said pager receiver is called, said pager receiver comprising:

first means responsive to said preassigned call number signal and selectively operable in an independent and dependent mode of operation for producing a first and a second

output signal in said independent and said dependent modes to enjoy said call tone service and said display service, respectively, said first output signal being produced as said call indication signal substantially immediately responsive to said preassigned call number signal, said second output signal being produced a predetermined interval of time after said first means is supplied with said preassigned call number signal, said second output signal serving also as said call indication signal; and

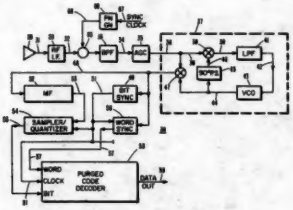
connecting means connected to said first means for putting said first means selectively in said independent and said dependent modes.

4,613,860

CODER-DECODER FOR PURGED BINARY BLOCK CODES

Robert J. Currie, Salt Lake City; Craig K. Rushforth, Kaysville, and John W. Zscheile, Jr., Farmington, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,503
Int. Cl.[4] H04Q *9/00*; G07F *11/12*
U.S. Cl. 340—825.57 **11 Claims**



1. Transmitting and receiving apparatus, comprising:

means for generating balanced code set signals,

means for generating digital data signals,

a purged code encoder coupled to said digital data signals for generating constant-weight unbalanced codewords defining said data signals and containing error correction bits,

means for combining said balanced code set signals and said unbalanced codewords to provide balanced digital signals defining said data signals and containing error correction bits for transmission,

transmitting means,

means for receiving said balanced digital signals containing error correction bits,

detector means comprising carrier tracking loop means connected to said receiving means for tracking said received signals,

said detector means adapted to remove said balanced code set signals and for recovering said unbalanced codewords and having bit synchronization signal means, word synchronization signal means and means for producing quantized data bit signals, and

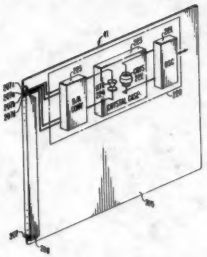
purged code decoder means coupled to said bit synchronization signal means, said word synchronization signal means and said quantized data bit signals for producing a best estimate of said data signals as an output.

4,613,861

PROCESSING SYSTEM HAVING DISTRIBUTED RADIATED EMISSIONS

Cyrus F. Ault, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 610,095, May 14, 1984, abandoned.
This application Jul. 9, 1985, Ser. No. 753,817
Int. Cl.[4] G08C *19/00*
U.S. Cl. 340—825.73 **26 Claims**



1. A computer circuit package for reducing additive emissions of signals of the same frequency radiated from a plurality of circuit packages including said computer circuit package each capable of having virtually identical frequency generating means for producing output signals of said same frequency in a computer having at least one central processing unit, and a bus connected to the central processing unit and defining a plurality of locations each for connecting to one of said circuit packages to provide a communication path between the central processing unit and the circuit package, each said location having an arrangement for uniquely identifying said last-mentioned location, said computer circuit package comprising:

generating means being cooperative with the location-identifying arrangement for generating clocking signals to control timing and synchronizing of operation of the computer circuit package in the computer and the clocking signals having a frequency that is dependent upon the identity defined by the location-identifying arrangement of the location defined by the bus connected to the central processing unit to which the computer circuit package is connected to generate clocking signals having a first frequency and harmonics of the first frequency when the package is connected to one location that are different from clocking signals having a second frequency and harmonics of the second frequency that it generates when connected to a second location, whereby harmonics generated by a plurality of the computer circuit packages each connected to a different one of a plurality of the locations are different from each other and hence are non-additive, to limit radiated emission levels.

4,613,862

ADAPTIVE MUTUAL INTERFERENCE SUPPRESSION METHOD

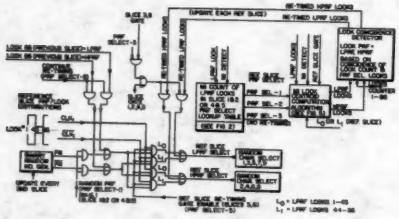
Bernard N. O'Donnell, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 26, 1984, Ser. No. 624,568
Int. Cl.[4] G01S *7/66*
U.S. Cl. 343—17.1 PF **1 Claim**

1. A method for minimizing sensitivity loss due to blanking when mutual interference (MI) between two or more pulse doppler radars of the same design is detectable by each radar, comprising the steps of:

(a) establishing a reference time period in which the time period includes a succession of coherent looks consisting of transmitted and received pulses at one PRF followed by the same number of coherent looks at a second PRF;

(b) determining the looks containing opposite PRF mutual interference data by noting the look numbers when opposite PRF blanking is detected;
(c) measuring the time centroids of the coherent looks containing MI;
(d) utilizing the MI centroid to compute the timing of the PRF distribution during successive slices by using a table lookup algorithm;



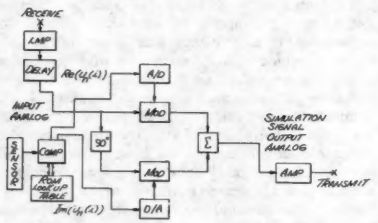
(e) establishing update rates for the re-timed PRF distributions and thresholds to determine when no PRF re-timing is required; and
(f) utilizing opposite PRF blanking filter data to blank CO-PRF detections for non zero closing rate or reduced frequency stability conditions where CO-PRF data is detectable within the doppler filter frequency region.

4,613,863

ELECTRONIC AUGMENTATION OF RADAR TARGETS

Richard L. Mitchell, Rolling Hills Estates, Calif., assignor to Mark Resources, Inc., Santa Monica, Calif.

Filed Aug. 17, 1981, Ser. No. 293,155
Int. Cl.[4] G01S *7/40*
U.S. Cl. 343—17.7 **43 Claims**



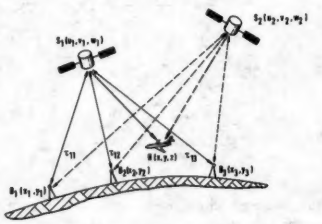
38. A method of simulating a radar target on a moving simulation platform as seen by a distant radar set comprising the steps of
(a) placing a plurality of pairs of radar antennas on the simulation platform, each pair having first and second radar antennas, each of the plurality of pairs of radar antennas being disposed so that each pair is substantially noncollinear with any other pair
(b) placing at least one sensing means on the simulation platform and detecting the direction of an incoming radar signal received from the distant radar set
(c) selecting, responsive to the sensing means, at least one of the plurality of pairs of the antenna, which selected at least one pair of antennas are not substantially collinear with the radar set, and
(d) for each of the at least one selected pair
(1) receiving radar signals from the radar set on the first and second radar antennas to provide first and second received radar signals
(2) delaying the first and second received radar signals by at least one delay time to provide at least one set of first and second delayed signals responsive to the first and second received signals, respectively and
(3) transmitting simulated target signals from the first and second antennas on the moving platform which are responsive to each corresponding set of second and first delayed signals, respectively, the simulated target signals transmitted from the first and second antennas each being characteristics of the simulated target, the amplitude and phase of the simulated target signals controlled in a manner further dependent upon the angle sensed by the sensing means, whereby the simulated target signals will simulate the glint and scintillation characteristics of the simulated target in the same flight path as the simulation platform, and whereby, for each selected pair of antennas, the signal intercepted by one antenna is retransmitted by the other, and vice versa, so that the total path lengths between the simulation platform and the distant radar set for the two signals will be identical, regardless of the relative geometry between the simulation platform and the distant radar set.

4,613,864

POSITION-FIXING SYSTEM

Günter Hofgen, Kornwestheim, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,012
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301613
Int. Cl.[4] G01S *5/02*; H04B *7/185*
U.S. Cl. 343—357 **8 Claims**

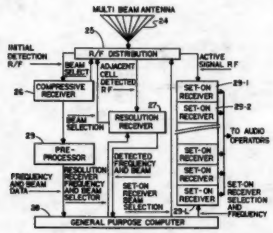


1. A position-fixing system wherein a user station (N) determines its position from the ranges to and the positions of several reference stations (S_j) carried by satellites, the ranges being measured by one-way ranging, and wherein the signals used for position-fixing purposes are radio-frequency signals, characterized in that the reference stations (S_j) are controlled so that only one of the reference stations within sight of the user station is active at any given time, that the ranges from each of several ground stations (B_i) to each reference station (S_j) are measured by a two-way ranging method, wherein an interrogator station, the reference station or the ground station, transmits interrogation signals while a transponder station, the ground station or the reference station, transmits reply signals, and that the position of a reference station is defined by the intersection of spheres having their centers at the ground stations, the radii of the spheres being the ranges from the respective ground station to the respective reference station and further characterized in that the interrogation signals and the reply signals each consist of two parts (FIG. 2) the first of which is a synchronization preamble (SY), and the second of which indicates when the interrogation signal was transmitted (t_j) from the interrogator station and received (t_i) by the transponder station, respectively.

4,613,865
RADIATION SOURCE IDENTIFICATION SYSTEM

Leonard J. Hoffman, Van Nuys, Calif., assignor to ITT Corporation, New York, N.Y.

Filed May 25, 1984, Ser. No. 613,930
Int. Cl.[4] G01S 5/02
U.S. Cl. 343—417 2 Claims

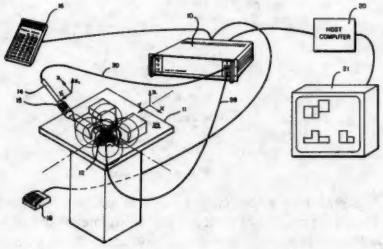


1. A system for determining the frequency of and location of a radiating source of electromagnetic energy, said system comprising: receiving antenna means including a plurality of beam ports; an electronic stepping switch connected from said beam ports; a course frequency scanning compressive receiver having an input connected from said electronic stepping switch; first means to cause said compressive receiver to scan repeatedly over a predetermined frequency band; second means to operate said stepping switch to shift the input of said compressive receiver from one beam port to the next for each frequency scan thereof; third means to store beam location and frequency signals detected by said compressive receiver; a frequency scanning resolution receiver for repeatedly scanning a band of frequencies at a rate slower than the scanning rate of said compressive receiver; a second electronic switch connected from said beam ports to said resolution receiver; and means, responsive to said means to store, to program a search through said second switch and said resolution receiver at said slower frequency scan rate to increase resolution in the vicinity of sources discovered by said compressive receiver.

4,613,866
THREE DIMENSIONAL DIGITIZER WITH ELECTROMAGNETIC COUPLING

Ernest B. Blood, Burlington, Vt., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 13, 1983, Ser. No. 494,292
Int. Cl.[4] G01S 5/04; G01B 7/14
U.S. Cl. 343—448 35 Claims



1. A three dimensional digitizer for establishing a digital database comprising:

a plurality of radiating means for radiating electromagnetic energy, said radiating means having independent components defining a reference coordinate frame;

a transmitter means for applying to said plurality of radiating means electrical signals which generate a plurality of radio frequency electromagnetic fields, said electromagnetic fields being distinguishable from one another;

a means for identifying the coordinates to be digitized;

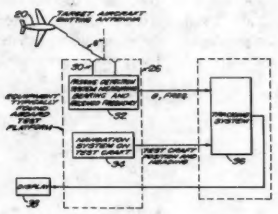
a plurality of receiving means for receiving said transmitted electromagnetic fields, said receiving means being disposed on said means for identifying and said receiving means having a plurality of independent components for detecting each of said transmitted electromagnetic fields; and

analyzing means for receiving the output of said receiving means and converting the components of said transmitted electromagnetic fields received by said receiving means into receiving means position and orientation, and thus determining the coordinates to be digitized and compensating for any offset between said means for identifying and said receiving means.

4,613,867
PASSIVE RANGING OF AN AIRBORNE EMITTER BY A SINGLE NON-MANEUVERING OR STATIONARY SENSOR

Martin Golinsky, Roslyn Heights, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,462
Int. Cl.[4] G01S 3/02, 3/52; A01C 21/00
U.S. Cl. 343—458 30 Claims



1. A method of passively determining the range to a moving target from a single test platform, said method comprising the steps of

traveling at a constant velocity a course in the test platform which is straight;

detecting at said platform the presence of an energy signal radiating from the target, and sampling said energy signal at three discrete times;

generating for each of said energy signal samples a first detection signal responsive to its angle of arrival at said platform, and a second detection signal responsive to its frequency on arrival at said platform;

storing said detection signals;

determining the range to said target utilizing said stored detection signals and said test platform velocity and position; and

generating a target indication signal representative of the range of said target.

4,613,868
METHOD AND APPARATUS FOR MATCHED IMPEDANCE FEEDING OF MICROSTRIP-TYPE RADIO FREQUENCY ANTENNA STRUCTURE

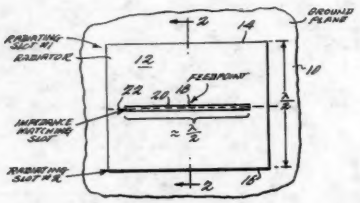
Michael A. Weiss, Nederland, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Feb. 3, 1983, Ser. No. 463,588
Int. Cl.[4] H01Q 1/38
U.S. Cl. 343—700 MS 11 Claims

1. A radio frequency antenna structure comprising a sym-

metrically fed dual-slotted half-wavelength microstrip radiator patch and including:

a linearly polarized radiator patch having a resonant half-wavelength dimension along its direction of linear polarization and a low impedance centerline transverse to said resonant dimension, said patch being disposed above a reference surface and defining a resonant cavity with a pair of spaced-apart radiating slots or apertures therebetween;



an r.f. feedpoint connection disposed substantially within said radiator patch; and

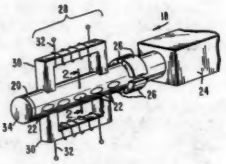
an impedance matching slot having an entirely closed boundary perimeter of less than one wavelength formed within said radiator patch substantially along said low impedance centerline transverse to said resonant dimension and also having predetermined location and dimensions for producing a corresponding predetermined r.f. impedance at said r.f. feedpoint connection.

4,613,869

ELECTRONICALLY SCANNED ARRAY ANTENNA

James S. Ajioka, Fullerton, and James V. Strahan, Yorba Linda, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,499
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—768 **30 Claims**



1. An array antenna for spatially scanning a beam of electromagnetic energy, comprising:

an end fed waveguide with a plurality of apertures formed therein;

a continuous ferrite rod disposed within the waveguide, and along a length thereof, the length including a plurality of apertures;

magnetic field means for applying a longitudinally oriented magnetic field through the ferrite rod, the magnetic field being applied across the waveguide and outside of the region of the scanning beam; and

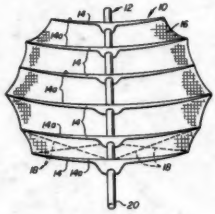
polarizing means for circularly polarizing electromagnetic energy which tranverses the waveguide.

4,613,870

SPACECRAFT ANTENNA REFLECTOR

Roger A. Stonier, San Jose, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 16, 1983, Ser. No. 532,881
Int. Cl.[4] H01Q *1/28*
U.S. Cl. 343—915 **18 Claims**



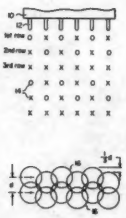
1. Antenna reflector structure for spacecraft use comprising: an elongated central boom mounted on the space craft for supporting the reflector structure relative thereto; a number of ribs mounted on the boom at spaced locations along the length thereof, each rib having an outer peripheral edge spaced laterally from the boom and extending in opposite directions from the boom; an RF conductive mesh adjacent to said edges of the ribs; and means coupling the mesh layer to the ribs at said edges thereof with the mesh layer having a predetermined contour.

4,613,871

GUARD DROPS IN AN INK JET PRINTER

James A. Katerberg, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 12, 1985, Ser. No. 797,094
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **9 Claims**



1. A method of producing guard drops in a continuous multi-jet ink jet printer of the type including means for producing a rectangular array of ink drops, said array having columns corresponding to the consecutive drops in a single jet, and rows corresponding to drops simultaneously produced from all of the jets, said method including the steps of providing a repeating pattern of one or more guard drops between print drops in a row and one or more guard drops between print drops in a column, characterized by: said pattern including one or more entire rows of guard drops.

4,613,872

RECORDER FOR SIDE-BY-SIDE DIGITAL RECORDING OF ANALOG DATA AND DIGITAL DATA

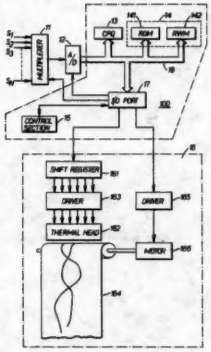
Hiroyuki Naito, and Masahiro Tohara, both of Fuchu, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

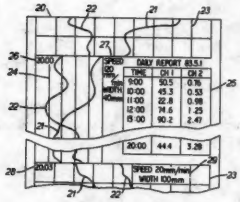
Filed Sep. 26, 1984, Ser. No. 654,468

Claims priority, application Japan, Sep. 26, 1983, 58-176490

Int. Cl.[4] G01D *9/32*

U.S. Cl. 346—1.1 **4 Claims**





1. A recorder comprising:

an analog-to-digital (A/D) converter for converting analog input data into a digital output;

a sampling time setting section for setting times at which the digital output of the A/D converter is to be sampled and for delivering an instruction at each of said sampling times;

a list form converter section for sampling the digital output from the A/D converter under the control of said instruction delivered by the sampling time setting section and for converting the sampled digital output into a list of data;

a memory for storing the list of data converted by the list form converter section;

a gate disposed in an output line from the memory;

an analog waveform recording condition setting section for setting first recording conditions, including a first paper feed speed, to be imposed during the recording of analog waveforms;

a data list recording condition setting section for setting second recording conditions, including a second paper feed speed which is faster than said first paper feed speed, to be imposed during the printing of a list of data;

a recording control section for receiving said digital output from the analog-to-digital converter, said first and second recording conditions and an output from the memory via said gate, and for delivering output data in conformity with a selected of said first and second recording conditions;

a data list output control section which, when the recording of a list of data is initiated, enables said gate and changes the selection of recording conditions imposed on the recording control section from the first recording conditions to the second recording conditions, and which, when the recording of the list is finished, disenables said gate and changes the selection of the recording conditions imposed on the recording control section back to the first recording conditions;

a thermal head;

means for feeding recording paper to said thermal head at either said first paper feed speed or said second paper feed speed as determined by said data list output control section; and

a head driver that drives said thermal head in response to the output data from the recording control section to make a record.

4,613,873

PRINTER WITH SUPPLY VOLTAGE CONTROL CIRCUIT

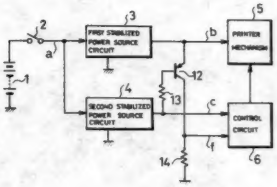
Tadao Tamukai, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 30, 1984, Ser. No. 666,478

Claims priority, application Japan, Oct. 28, 1983, 58-166989[U]

Int. Cl.[4] G01D *9/00*; H02H *3/24*

U.S. Cl. 346—33 R **3 Claims**



1. A printer comprising a printing mechanism, a control circuit for controlling operation of said printing mechanism and a power supply including a battery, wherein said power supply includes a first stabilized power source circuit which converts an output voltage of said battery to a predetermined first supply voltage and then supplies it to said printing mechanism and a second stabilized power source circuit which converts an output voltage of said battery to a second supply voltage which is lower than said first supply voltage and then supplies it to said control circuit, and moreover a detecting circuit which detects when difference between the supply voltages of said first stabilized power source circuit and second stabilized power source circuit has reached a value lower than a predetermined threshold value.

4,613,874

MAGNETIC PRINTING

Lyne S. Trimble, 4724 Arcola Ave., North Hollywood, Calif. 91602

Filed Jul. 30, 1984, Ser. No. 635,529

Int. Cl.[4] G01D *15/12*

U.S. Cl. 346—74.6 **3 Claims**

1. An apparatus for producing visible patterns in a magneto-chemical film which includes in combination:

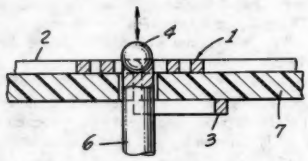
an x, y matrix of solenoids covering a surface,

each solenoid comprising an electrical conductive coil containing a centered, directionally oriented magnetic metal sphere core,

the solenoids so interconnected that each can be selectively actuated through x, y electrical connections,

microsecond rate electrical signals actuating the solenoids to

induce small magnetic fields that add to an established magnetic field, and



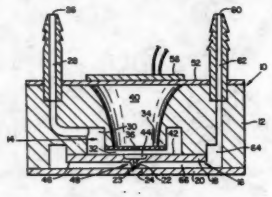
the combined magnetic fields causing point to point recording upon a magnetochemical surface placed against the solenoid matrix surface.

4,613,875

AIR ASSISTED INK JET HEAD WITH PROJECTING INTERNAL INK DROP-FORMING ORIFICE OUTLET

Hue P. Le; Charles W. Jaeger, and James C. Oswald, all of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 8, 1985, Ser. No. 720,843
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **16 Claims**



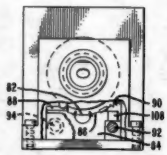
1. In an ink jet head including an ink chamber which is adapted to receive ink under pressure, the ink chamber having an ink chamber wall with a valve free ink passageway leading to an internal ink drop-forming orifice outlet, an actuator which applies pressure pulse to the ink chamber so as to cause ink to flow through the ink passageway and produce an ink drop at the internal ink drop-forming orifice outlet, an air chamber with an air chamber wall having a first internal side surface and a second external side surface, an external ink jet head orifice being provided through the air chamber wall from the first to second side surfaces and in axial alignment with the internal ink drop-forming orifice outlet, the air chamber being adapted to receive pressurized air which flows inwardly from the sides of the air chamber to form a generally concentric air stream surrounding the internal ink drop-forming orifice outlet and which air stream is directed out of the external ink jet head orifice, the air stream carrying ink drops produced at the internal ink drop-forming orifice outlet, in response to the pressure pulses, outwardly through the external ink jet head orifice and toward printing medium, the improvement comprising meniscus supporting means projecting from the ink chamber wall toward the air chamber wall in axial alignment with the external ink jet head orifice, the ink meniscus supporting means projecting substantially no further than to the first internal side surface of the air chamber wall, the ink menisus supporting means including an outer ink mensius supporting surface spaced from the ink chamber wall, the internal ink drop-forming orifice outlet being provided through the ink meniscus supporting surface, whereby a meniscus of ink at the internal ink drop-forming orifice outlet is confined to the ink meniscus supporting surface by the concentric air stream to thereby enhance the uniformity of ink drop formation by the ink jet head.

4,613,876

LASER RECORDING SYSTEM

Siegfried H. Mohr, Santa Clara, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 28, 1984, Ser. No. 675,919
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 **16 Claims**



16. Apparatus for recording photographic images on film by scanning the film in a raster pattern with a spot of light by focusing a laser beam which is modulated in accordance with data defining an image to be recorded, the apparatus comprising

means for advancing the film longitudinally along a path parallel with the laser beam,

rotatable scanning means for focusing the laser beam onto the surface of the film in cyclical manner to define successive lines of the raster pattern,

curved platen means including stop means comprising a plate secured at one side of the platen means for holding the film in position to provide a circular light path for the spot on the surface thereof, and

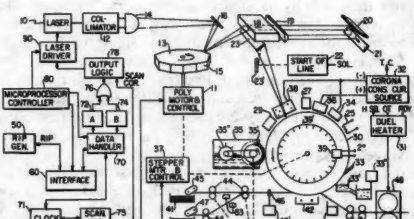
resilient means comprising a spring associated with the curved platen means for urging the film against the stop means plate and for maintaining the film in precise position for recording of images thereon, said urging being in a direction that is predominantly parallel to the surface of the film.

4,613,877

HIGH RESOLUTION LASER PRINTER

David R. Spencer, Melville; Amnon Goldstein, Pelham, both of N.Y.; David Grey, Lexington, Mass.; Theodore G. Balchunas, Huntington Station, and Arthur B. Kaplan, Merrick, both of N.Y., assignors to Data Recording Systems, Inc., Melville, N.Y.

Filed Nov. 26, 1984, Ser. No. 674,622
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 **10 Claims**



1. A high resolution laser printer comprising:

photosensitive medium;

laser means for generating a modulated beam of laser light;

at least one moving mirror surface located in the path of said

light beam and reflecting the beam such that it sweeps across said medium;

an optical collimator means located between said laser means and said mirror surface for forming the modulated laser light into a substantially collimated beam;

first cylindrical lens means located between said collimator means and said mirror surface for focusing the light output of said collimator means in the sagittal or cross-scan direction at a position near, but not on, said mirror surface;

a scan lens assembly positioned between said mirror surface and said medium for focusing the reflected light in the horizontal or scan direction such that it is in focus along a substantially straight line across said medium; and

a second cylindrical lens positioned between said scan lens assembly and said medium for focusing said beam in the sagittal direction along said medium.

4,613,878
TWO-COLOR THERMOSENSITIVE RECORDING MATERIAL

Norihiko Inaba, Numazu, and Kiyotaka Iiyama, Mishima, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,420

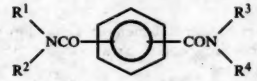
Claims priority, application Japan, Nov. 15, 1984, 59-241333; Dec. 27, 1984, 59-273816

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—204 **7 Claims**

1. A two-color thermosensitive recording material comprising a support material, a first thermosensitive coloring layer and a second thermosensitive coloring layer supported on said support material, with said second thermosensitive coloring layer overlaid on said first thermosensitive coloring layer, the colors developed by said two coloring layers being different from each other, the coloring temperature for said second thermosensitive coloring layer being lower than that for said first thermosensitive coloring layer, at least said second thermosensitive coloring layer containing a basic leuco dye and a color developer capable of inducing color formation in said leuco dye upon application of thermal energy, and a decolorizing agent for decoloring the color developed in said second thermosensitive coloring layer at the time of color development of said first thermosensitive coloring layer being contained in said first thermosensitive coloring layer or in a decolorizing intermediate layer interposed between said first thermosensitive coloring layer and said second thermosensitive layers, which decolorizing agent is selected from the group consisting of:

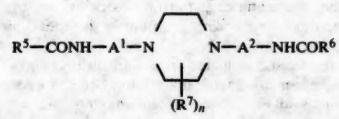
(i) a di-substituted aromatic diamide derivative having the formula (I),



(I)

wherein R^1, R^2, R^3 and R^4 independently represent hydrogen, an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group, and R^1 and R^2, and/or R^3 and R^4 can respectively form rings by the terminals of the respective groups being combined with each other, and

(ii) a piperazine derivative including two acylamino groups, having the formula (II),



(II)

wherein A^1 and A^2 represent an alkylene group, R^5 and R^6 independently represent hydrogen, a non-substituted or substituted alkyl group, a non-substituted or substituted aryl group, a non-substituted or substituted aralkyl group, a non-substituted or substituted cycloalkyl group, R^7 represents a lower alkyl group, and n is an integer of 0 to 2.

4,613,879
CHROMOGENIC RECORDING MATERIALS

Masakichi Yahagi, Tokyo; Tetsuo Igaki, Kawagoe; Sinzi Yoshinaka, Iwatsuki; Kousaku Morita, Saitama; Morikuni Saito, Tokyo, and Kimiaki Kinoshita, Kitamoto, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,568

Claims priority, application Japan, Apr. 26, 1983, 58-72080

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—209 **9 Claims**

1. A chromogenic recording material comprising 3-N-isobutylethylamino-6-methyl-7-phenylaminofluoran, an acidic substance capable of causing the color formation of said fluoran compound and a substrate which supports the fluoran compound the acidic substance on its surface.

4,613,880
LIGHT SENSITIVE APPARATUS

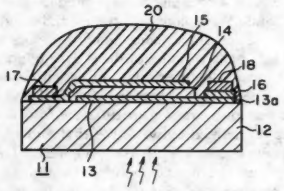
Yukinori Kuwano; Shoichi Nakano, both of Osaka, and Masaru Takeuchi, Kyoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Continuation of Ser. No. 406,441, Aug. 9, 1982. This application Jul. 26, 1985, Ser. No. 759,496

Claims priority, application Japan, Aug. 19, 1981, 56-129836

Int. Cl.[4] H01L *45/00, 27/14*

U.S. Cl. 357—2 **9 Claims**



1. A light sensitive apparatus comprising:

a light-transmissible substrate having a major surface;

a first, transparent electrode deposited on said major surface of said light-transmissible substrate;

a thin film layer of a non-single crystal semiconductor material deposited on said transparent electrode so as to leave a portion of said transparent electrode and a corresponding side surface of said transparent electrode exposed and so as to completely cover the remaining portion of said transparent electrode including the remaining opposite side surface thereof;

a second electrode disposed on said non-single crystal semiconductor layer and an said major surface of said substrate;

a first lead member electrically connected to said exposed portion of the transparent electrode and extending along the surface of said exposed portion;

a second lead member electrically connected to said second electrode and extending along the surface of said second electrode;

said first and second lead members being such as to be capable of mechanically supporting said light sensitive apparatus; and

an electrically conductive layer being provided between the exposed portion of said first transparent electrode and said first lead member connected thereto.

4,613,881

VERTICAL SEMICONDUCTOR PHOTOELECTRIC TRANSDUCER WITH IMPROVED SEPARATED GATE STRUCTURE

Jun-ichi Nishizawa, 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi 980, Japan

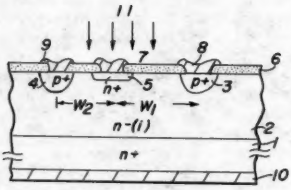
PCT No. PCT/JP83/00295, § 371 Date Apr. 30, 1984, § 102(e) Date Apr. 30, 1984, PCT Pub. No. WO84/01056, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 2, 1983, Ser. No. 610,300

Claims priority, application Japan, Mar. 9, 1982, 57-153429

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **8 Claims**



1. A vertical semiconductor photoelectric transducer with improved separated gate structure, comprising a semiconductor substrate of one conductivity type, a semiconductor high resistivity layer formed on the substrate, a main source region and a main drain region formed by second conductivity type impurity diffusion regions, a high resistivity semiconductor channel region of the same conductivity type as the main source and drain regions for forming a main current path between the main source and drain semiconductor regions, and first and second gate regions reverse in conductivity type from the main source and drain semiconductor regions and provided in the vicinity of and on sides of the source region for controlling a main current between the source and drain, characterized in that the distances between the first and second gate regions and the source region are different from each other, the channel region defined between the first and second gates is completely depleted by both the potentials of the first and second gates, and the distance between the first gate region and the source region is made longer than that between the second gate region and the source region to increase the optical sensitivity of the first gate region relative to the optical sensitivity of the second gate region.

4,613,882

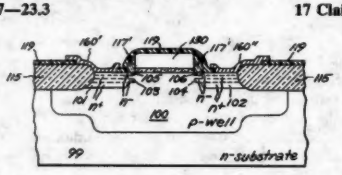
HYBRID EXTENDED DRAIN CONCEPT FOR REDUCED HOT ELECTRON EFFECT

Joseph M. Pimbley; Gennady Gildenblat; Ching-Yeu Wei, all of Schenectady, N.Y., and Joseph Shappir, Jerusalem, Israel, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,642

Int. Cl.⁴ H01L *29/78, 29/06*

U.S. Cl. 357—23.3 **17 Claims**



1. A metal oxide semiconductor field effect transistor comprising:

a semiconductor body doped with a first polarity dopant;

an insulating layer disposed over a portion of said body; and

an electrically conductive gate electrode disposed over said insulating layer so as to be electrically insulated from said semiconductor body;

said semiconductor body having a source region heavily doped with a second polarity dopant and a drain region heavily doped with said second polarity dopant, said source and drain regions being disposed in said semiconductor body to a specified depth on either side of said gate electrode; and

said semiconductor body having a first lightly doped protrusion extending from at least one of said source and said drain regions, said dopant in said first protrusion being a second polarity dopant, each said first protrusion being disposed beneath the surface of said semiconductor body and extending toward the region beneath said gate electrode, each said first protrusion being spaced apart from the boundary between said semiconductor body and said insulating layer;

said semiconductor body also having a second lightly doped protrusion extending from at least one of said source and said drain regions, said dopant in said second protrusion being a second polarity dopant, each said second protrusion being disposed adjacent to the surface of said semiconductor body and extending toward the region beneath said gate electrode and spaced apart from said first protrusion there being at least three of said protrusions.

4,613,883

DYNAMIC SEMICONDUCTOR MEMORY CELL AND METHOD FOR ITS MANUFACTURE

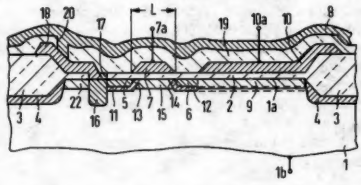
Jenöe Tihanyi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,942

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926417

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **10 Claims**



1. A dynamic semiconductor memory cell comprising:

a semiconductor body doped to a first conductivity and including a surface;

first and second regions in said semiconductor body at said surface and doped to an opposite, second conductivity;

a memory capacitor including a doped zone of the second conductivity in said semiconductor body and an electrode carried by and insulated from said surface;

a pair of zones extending generally parallel to said surface in said semiconductor body and having a higher degree of said first conductivity than said semiconductor body, said zones lying below respective ones of said first and second regions and including edge portions extending up to said surface to limit the respective regions in the lateral direction;

a gate carried by and insulated from said surface; and

a zone of said semiconductor body lying beneath said gate connecting said edge portions and having said second conductivity,

parts of said edge portions lying at said surface forming a two-part channel area of a field effect transistor.

4,613,884
LIGHT CONTROLLED TRIAC WITH LATERAL THYRISTOR FIRING COMPLEMENTARY MAIN THYRISTOR SECTION

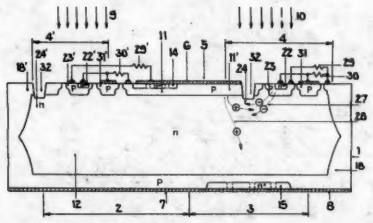
Jörg Angerstein, Flein, and Dieter Silber, Obertshausen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Frankfurt and Telefunken Electronic GmbH, Heilbronn, both of, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 547,095

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1982, 3240564

Int. Cl.[4] H01L *29/747*

U.S. Cl. 357—39 **14 Claims**



1. In a controllable semiconductor circuit element including: first and second antiparallel vertical thyristors arranged in a semiconductor wafer, with each of said vertical thyristors being composed of four successive zones of alternating conductivity type, and with three of said zones being common to both said thyristors while the respective fourth, outer zones, which act as emitters, of said first and second vertical thyristors are provided in the upper surface and in the lower surface respectively of said semiconductor wafer within the respectively adjacent control base zone; first and second load current terminals, which are common to both said vertical thyristors, disposed on said upper and lower surfaces, respectively; and a further controllable lateral switching means integrated in said semiconductor wafer for firing said second vertical thyristor; the improvement wherein said lateral switching means is a first lateral thyristor having four successive zones of alternating conductivity type extending along said upper surface with one outer zone of said lateral thyristor being coupled electrically to the one of said three zones common to both said vertical thyristors which is of the same conductivity type and is disposed at the said upper surface of said semiconductor wafer, and with the other outer zone of said lateral thyristor being coupled electrically with the one of said three zones common to both said vertical thyristors which is of the opposite conductivity type and is disposed at said lower surface of semiconductor wafer; and further comprising a further lateral thyristor coupled to said first vertical thyristor for initiating the ignition of same and with the lateral zone sequence of said further lateral thyristor extending along said upper surface of said semiconductor wafer.

4,613,885
HIGH-VOLTAGE CMOS PROCESS

Roger A. Haken, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 344,588, Feb. 1, 1982, Pat. No. 4,442,591. This application Jan. 12, 1984, Ser. No. 570,321

Int. Cl.[4] H01L *29/78, 21/265, 21/76*

U.S. Cl. 357—42 **11 Claims**

1. A high-voltage CMOS product produced by the process, comprising the steps of:

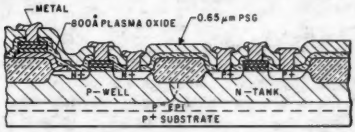
providing a silicon surface;

providing N-type device regions in said surface;

providing P-type device regions in said surface;

depositing a moat masking layer on respective moat areas of said N-type and P-type device regions;

applying a channel stop implant into portions both of said N-type device regions and also of said P-type device regions which are exposed by said moat masking layer, said channel stop implant comprising at least 5×10^{12} cm^{-2} of boron at an energy of at least 45 keV;



selectively oxidizing said silicon surface where not masked by said moat masking layer;

stripping said moat masking layer; and

forming desired NMOS and PMOS devices in said respective moat regions.

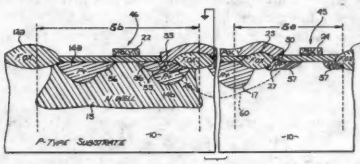
4,613,886
CMOS STATIC MEMORY CELL

Ronald J. C. Chwang, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 590,896, Mar. 19, 1984, which is a continuation of Ser. No. 281,709, Jul. 9, 1981, abandoned. This application Dec. 13, 1985, Ser. No. 808,655

Int. Cl.[4] H01L *27/02, 29/78*

U.S. Cl. 357—42 **6 Claims**



1. A complementary metal-oxide-semiconductor static memory cell formed on a substrate where first insulative regions are used for field insulation and a second thinner insulative layer for insulating channel regions of field effect transistcrs from overlying gates, comprising:

a first p-type region disposed in said substrate covered with said thinner insulative layer;

an n-type well disposed in said substrate where said well is physically separated from said p-type region, said well covered with said thinner insulative layer;

a grounding line for coupling said p-type region to a predetermined potential;

a contact for connecting said p-type region with said grounding line disposed through said thinner insulative layer;

first and second generally parallel, spaced-apart, elongated polysilicon members, said members crossing said first p-type region;

a first p-channel transistor disposed on a first side of said first p-type region, wherein said first p-channel transistor is formed by two p-type areas disposed in said n-well and said first polysilicon member is disposed above said n-well and defines the gate of said first p-channel transistor;

a second p-channel transistor disposed on said first side of said first p-type region, wherein said second p-channel transistor is formed by two p-type areas disposed in said n-well and said second polysilicon member is disposed above said n-well and defines the gate of said second p-channel transistor;

a first n-channel transistor disposed on an opposite side of said first side of said first p-type region, wherein said first n-channel transistor is formed by two n-type areas dis-

posed in said substrate and said first polysilicon member disposed above said substrate defines the gate of said first n-channel transistor, source region of said first n-channel transistor being coupled to said grounding line;

a second n-channel transistor disposed on said opposite side of said first p-type region, wherein said second n-channel transistor is formed by two n-type areas disposed in said substrate and said second polysilicon member disposed above said substrate defines the gate of said second n-channel transistor, source region of said second n-channel transistor being coupled to said grounding line;

a first diode formed by disposing n-type material in one of two p-type areas of said first p-channel transistor;

a second diode formed by disposing n-type material in one of two p-type areas of said second p-channel transistor;

said first and second p-channel transistors, and said first and second n-channel transistors being formed subsequent to said p-type region, said p-type region disposed at greater depth than said transistors;

said contact for connecting said p-type region and said grounding line also making contact between one of said source regions of said n-channel transistors and said grounding line;

coupling means for coupling said first and second p-channel transistors and said first and second n-channel transistors to form a bistable circuit, said coupling means including a third polysilicon member for coupling said first polysilicon member to the drain terminal of said second n-channel transistor and cathode of said second diode, a fourth polysilicon member for coupling said second polysilicon member to the drain terminal of said first n-channel transistor and cathode of said first diode;

whereby latch-up problems are reduced and a denser memory cell is realized.

4,613,887

SEMICONDUCTOR DEVICE WITH A MEANS FOR DISCHARGING CARRIERS

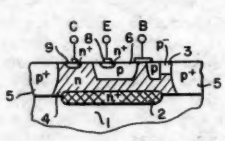
Takeshi Fukuda; Yoshiharu Mitono, both of Tokyo, and Tadashi Kiriseko, Kanagawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 204,930, Nov. 7, 1980, abandoned. This application Jan. 27, 1984, Ser. No. 574,583

Claims priority, application Japan, Nov. 14, 1979, 54-147454; Dec. 15, 1979, 54-162959; Dec. 15, 1979, 54-162960

Int. Cl.[4] H01L *27/04;* **H03K** *19/013, 19/088*

U.S. Cl. 357—43 **3 Claims**



1. A semiconductor device comprising

a semiconductor substrate of a first conductivity type,

a semiconductor layer of a second conductivity type opposite to said first conductivity type on said substrate,

a base region of said first conductivity type in said semiconductor layer,

an emitter region of said second conductivity type in said base region,

an isolation region of said first conductivity type in said semiconductor layer, reaching to said substrate and surrounding said base region,

means for Schottky clamping said base region to said semiconductor layer, and

means for discharging carriers including a first diffused region of said first conductivity type for electrically connecting said base region and said isolation region with a predetermined resistance value when said base region is forward biased with respect to said semiconductor layer, and for electrically isolating said base region from said isolation region when the potential of said base region is reverse biased with respect to said semiconductor layer.

4,613,888

SEMICONDUCTOR DEVICE OF MULTILAYER WIRING STRUCTURE

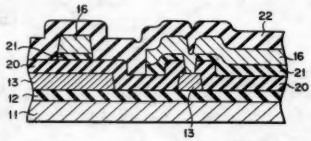
Yasukazu Mase, Tokyo; Masahiro Abe, Yokohama; Masaharu Aoyama, Fujisawa, and Takashi Ajima, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 24, 1984, Ser. No. 634,030

Claims priority, application Japan, Jul. 28, 1983, 58-138312

Int. Cl.[4] H01L *21/44, 21/47, 21/94*

U.S. Cl. 357—54 **16 Claims**



1. A semiconductor device of a multilayer wiring structure comprising:

a semiconductor substrate;

a first insulation film having a predetermined pattern formed on said semiconductor substrate;

a first wiring layer having a predetermined pattern formed on said first insulation film;

a second insulation film having a predetermined pattern formed on said first insulation film;

a third insulation film having a predetermined pattern formed on said second insulation film, said second and third insulation films having a first continuous contact hole;

a second wiring layer formed on said third insulation film to fully cover said third insulation film, said second wiring layer extending into said first contact hole and contacting said first wiring layer; and

a fourth insulation film formed on an entire major surface of the structure and contacting said second insulation film.

4,613,889

RANDOM ACCESS MOS/MEMORY CELL WITH CAPACITOR AND TRANSISTOR FORMED IN RECESS

Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 192,388, Sep. 30, 1980, Pat. No. 4,467,450, which is a continuation of Ser. No. 803,495, Jun. 6, 1977, Pat. No. 4,225,945, which is a continuation-in-part of Ser. No. 648,594, Jan. 12, 1976, abandoned, and Ser. No. 722,841, Sep. 13, 1976, Pat. No. 4,240,092. This application Aug. 14, 1984, Ser. No. 640,722

The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.

Int. Cl.[4] H01L *29/78;* **G11C** *11/34*

U.S. Cl. 357—54 **18 Claims**

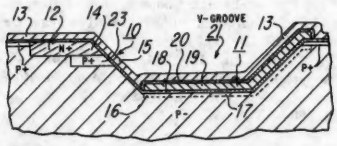
1. An N-channel memory cell formed at a face of a silicon body and having an insulated-gate transistor means and capacitance means,

the transistor means including a gate composed of conductive material and including a source-to-drain path formed in the silicon of said face, a heavily doped N+ region as one end of the source-to-drain path in said face,

the capacitance means including a plate composed of con-

ductive material and including a capacitor region in the silicon of said face spaced from said plate by a thin dielectric,

the improvement comprising:



an anisotropically-etched recess extending into said face of the silicon body, the capacitor region being defined within the recess, and the source-to-drain path of the transistor means being defined in at least one sidewall of the recess, the gate being within the recess and spaced from the capacitance means.

4,613,890

ALLOYED CONTACT FOR N-CONDUCTING GAALAS-SEMI-CONDUCTOR MATERIAL

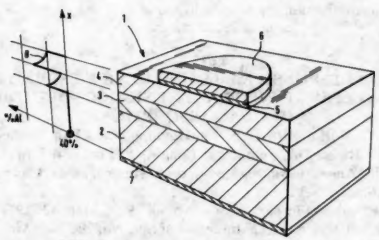
Werner Schairer, Weinsberg, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 608,725

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318683

Int. Cl.⁴ H01L *23/54*

U.S. Cl. 357—67 **10 Claims**



1. An alloyed contact for n-conducting GaAlAs semiconductor material with a high Al content, wherein a first layer (5) consisting of a metal from one of the subgroups IVb, Vb, VIb of the periodic table is disposed on the semiconductor material (4), and wherein this metal layer is covered by a second metal layer (6) consisting of a gold germanium alloy.

4,613,891

PACKAGING MICROMINIATURE DEVICES

Kwok K. Ng, Union, and Simon M. Sze, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 17, 1984, Ser. No. 581,259

Int. Cl.⁴ H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **6 Claims**

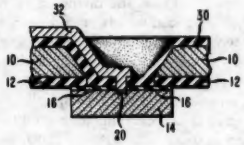
1. An assembly comprising

a wafer having planar top and bottom surfaces, said wafer having conductive terminal portions along the periphery thereof overlying said top surface,

at least one microminiature device mounted on the bottom surface of said wafer, said device including in a central portion of its top surface conductive pads facing said wafer,

a sloped-wall aperture formed through said wafer in registry with the central portion of each mounted device,

and a conductive pattern connecting the pads of a mounted device to said terminal portions, said pattern being disposed on at least one of the sloped walls associated with a mounted device and overlying the planar top surface of said wafer, wherein said wafer and each of said devices comprises monocrystalline silicon.



4,613,892

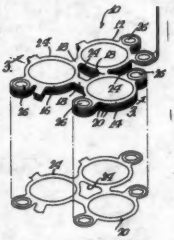
LAMINATED SEMICONDUCTOR ASSEMBLY

Thomas Sutrina, and John Readman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 19, 1985, Ser. No. 703,102

Int. Cl.⁴ H01L *23/16*

U.S. Cl. 357—75 **10 Claims**



1. An electrical assembly of semiconductors comprising:

at least two stacks of semiconductors, said stacks being in spaced, but side by side, generally parallel relation; and

a housing for said stacks; said housing being comprised of a series of stacked thin, generally planar layers of electrically and thermally conductive-and electrically insulating material encompassing said stacks, some said layers having cut outs to receive the semiconductors of said stacks and being bonded together about said cutouts, said layers further being unbonded in areas between said stacks so that said layers may individually deform in said areas to accommodate dimensional differences occurring between said stacks along the length thereof.

4,613,893

METHOD OF PRODUCING A TIME-MULTIPLEX COLOR TELEVISION SIGNAL

Otto Weitzel, Stadtallendorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,298

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339533

Int. Cl.⁴ H04N *11/10*

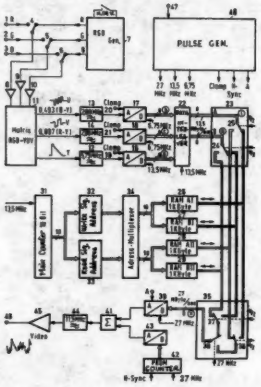
U.S. Cl. 358—11 **4 Claims**

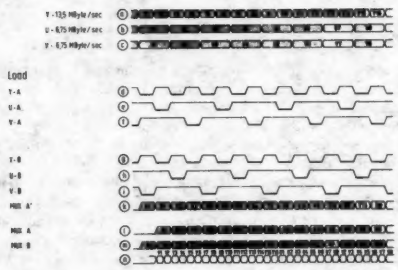
1. Method of producing a time multiplex color television signal of which the several signal components (Y,U,V) necessary for reproduction of one color television line are multiplexed into and contained in a single television line transmission period, comprising the initial step of producing by sepa-

rately digitalizing into digital sample words a luminance component (Y) and two chrominance components (U,V), a separately coded television signal in which the luminance component (Y) is sampled for digitalization at a higher rate than said chrominance components and further comprising in accordance with the invention, the further steps of:

time-interleaving said words of said components in the ratio of two words of said luminance component to every word of each of said chrominance components at the word interleaving rate equal to said higher sampling rate, said higher sample rate being substantially twice the sampling rate of each of said chrominance components, and producing thereby two data streams (l,m), each of said word interleaving rate;

writing the data of said two data streams line by line into a set of stores from which they are thereafter read out line





by line, said set of stores being disposed so that single lines of said respective data streams are successively written in a first pair of separate stores of said set while previously stored single lines of said respective data streams are successively read out of a second pair of separate stores of said set, under control of a corresponding addressing operation for writing into and reading out of said stores, the word write-in rate being equal to said higher sampling rate and the word read-out rate being twice said higher sampling rate with the read-out periods alternating between a store of said first pair and a store of said second pair, and

combining words alternately taken from line sequences read out respectively from a store of said first pair and a store of said second pair into a sequential data word stream (n) which is time multiplexed line by line.

4,613,894

METHOD AND DEVICE FOR DETECTION OF MOVING POINTS IN A TELEVISION IMAGE FOR DIGITAL TELEVISION SYSTEMS PROVIDING BIT-RATE COMPRESSION, WITH CONDITIONAL-REPLENISHMENT

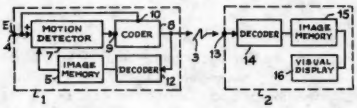
Jean-Yves Catros; Franck Chapuis, both of Rennes, and Francois Malo-Renault, Cesson-Sevigne, all of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 15, 1984, Ser. No. 640,984

Claims priority, application France, Aug. 30, 1983, 83 13910

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—13 **10 Claims**



1. A method for detection of moving points in a television image for digital television systems providing bit-rate compression, with conditional-replenishment, comprising the steps of computing a luminance and/or chrominance gradient indicator (I_g) at each point of the image, computing a threshold value $S(X_o)$ as a function of each gradient obtained, measuring the inter-image luminance and/or chrominance difference of each point of the image, comparing the inter-image difference at each point with the corresponding computed threshold value, applying the result of the comparison to the input of a density-filtering device for detecting the density of moving points in proximity to each scanned point and comparing the density obtained at each scanned point with a predetermined density threshold in order to declare each scanned point in motion when the density corresponding to said point exceeds the predetermined density threshold value.

4,613,895

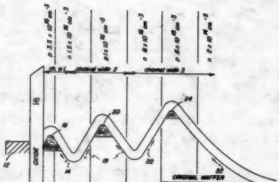
COLOR RESPONSIVE IMAGING DEVICE EMPLOYING WAVELENGTH DEPENDENT SEMICONDUCTOR OPTICAL ABSORPTION

Bruce C. Burkey; Roger S. VanHeyningen, both of Rochester, N.Y.; Richard A. Spaulding, Longwood, Fla., and Edward L. Wolf, Ames, Iowa, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 885,920, Mar. 13, 1978, abandoned, which is a continuation of Ser. No. 780,944, Mar. 24, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,830

Int. Cl.[4] H04N *9/04*

U.S. Cl. 358—41 **27 Claims**



1. In a solid state device of the type comprising a semiconductor material having a plurality of regions of alternating dopant types within the material, the device having a light receiving surface, a photosensitive element for simultaneously generating a plurality of photosignals, comprising:

a. first channel means for collecting a first photosignal generated, in response to light falling on said light receiving surface, in a first region extending to a first depth, with respect to said surface, within said semiconductor material, said first channel means having a predetermined spectral response; and

b. buried channel means, disposed beneath said first channel means, with respect to said surface, for collecting a second photosignal generated, in response to light falling on said surface, in a second region extending to a second depth greater than said first depth, said second channel means having a predetermined spectral response different from said spectral response of said first channel due to the differential absorption of light by the semiconductor material, said first and second photosignal generating regions being superposed within said element.

4,613,896

METHODS AND APPARATUS FOR AVOIDING MOIRE IN COLOR SCANNERS FOR GRAPHIC ART

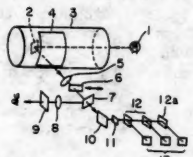
Nobuhiro Takita, Kyoto; Yosuke Shimamoto, Kusatsu; Hiroichi Tada, and Yutaka Tamura, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jan. 2, 1985, Ser. No. 688,292

Claims priority, application Japan, Mar. 30, 1984, 59-64989; Sep. 5, 1984, 59-67565[U]

Int. Cl.⁴ G03F *3/10*

U.S. Cl. 358—76 **16 Claims**



1. A method for avoiding the occurrence of moire in color scanners for graphic art, the method comprising:

modulating light rays from the color original through a pick-up lens by means of a low pass filter, prior to starting the color scanning;

projecting the modulated rays on a lattice plane;

adjusting the low-pass filter through observation of the moire appearing on the lattice plane until the moire disappears thereon; and

obtaining signals for recording the picture on the color original by light rays from the color original through the adjusted low-pass filter.

4,613,897

REPRODUCTION OF COLORED IMAGES

Peter W. Stansfield, Hertfordshire, England, assignor to Crosfield Electronics (USA) Limited, London, England

Filed Oct. 8, 1985, Ser. No. 785,377

Claims priority, application United Kingdom, Oct. 8, 1984, 8425339

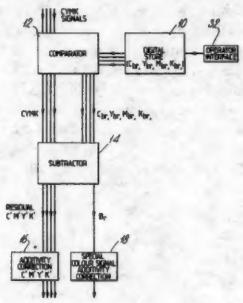
Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—80 **8 Claims**

1. A method of reproducing a coloured original picture for which signals representing blue, green and red components of the original have been derived and including preparing a colour separation representing a colour which is not complementary to blue, green or red, comprising:

storing values defining at least the characteristic elements of curves (FIG. 1) which respectively represent yellow, magenta and cyan component values (Ybr, Mbr, Cbr) which together correspond to a range of values for the required special colour separation;

comparing a combination of picture element values for yellow, magenta and cyan (Y,M,C), derived from the blue, green and red component signals for each picture element, with different sets of yellow, magenta and cyan values (Ybr, Mbr, Cbr) derived from the above-mentioned curves and corresponding to different values for the required special-colour separation (Br);



and selecting a value for the desired special-colour separation for which each of the yellow, magenta and cyan values of the said set (Ybr, Mbr, Cbr) is not greater than the corresponding value (Y,M,C) derived from the picture element, the selected value for the special-colour separation varying with the picture-element values for yellow, magenta and cyan.

4,613,898

IMAGING SYSTEMS

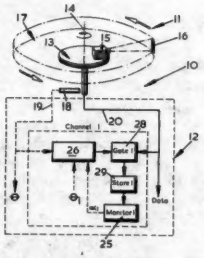
Ralph H. Bagnall-Wild, Traigh-Na-Mara, and Herbert M. Runciman, Glasgow, both of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Apr. 17, 1984, Ser. No. 602,065

Claims priority, application United Kingdom, May 16, 1983, 8313383

Int. Cl.⁴ H04N *7/18, 3/20*

U.S. Cl. 358—87 **6 Claims**



1. An imaging system comprising an image-data collection station and an image monitoring station, wherein said collection station comprises image-data collection means having a fixed field of view and means for effecting rotation of said field of view about an azimuthal axis whereby image data is continuously collected from a wide angle field, angle-sensing means associated with said rotation-effecting means for sensing instantaneous angular position of said fixed field of view within said wide angle field, image-data delivery means for continuously delivering collected image-data from said collection station to said monitoring station and angular-position-signal delivery means for continuously delivering said angular posi-

tion signal from said collection station to said monitoring station,

and wherein said monitoring station comprises a visual display monitor having a predetermined display field, an operator-actuable selector for selecting a particular angular position within said wide angle field and evaluating an associated range of angular positions within said wide angle field corresponding to said predetermined display field, data-capture means operable by said selector to capture repeatedly from the continuous delivery of image-data received by said monitoring station that image data from said associated range of angular positions, image-data store means connected to receive said captured data at each capture and to store captured data until the next data capture, the visual display monitor being connected to said store means to display the image data stored therein.

4,613,899

IMAGE PICKUP SYSTEM CAPABLE OF REPRODUCING A STEREO AND/OR A NONSTEREO IMAGE BY THE USE OF A SINGLE OPTICAL SYSTEM

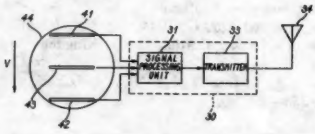
Ryushi Kuwano, and Riichi Nagura, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Aug. 10, 1984, Ser. No. 639,950

Claims priority, application Japan, Aug. 12, 1983, 58-147549; Aug. 12, 1983, 58-147550; Sep. 9, 1983, 58-165965

Int. Cl.[4] H04N *13/02*

U.S. Cl. 358—88 **14 Claims**



1. An image pick up system for use with a craft capable of flying along a flight path over over an object zone to be imaged, said system comprising:

(A) a single optical system for projecting an image of said object zone onto an image plane, said image plane having:

(1) a forward zone onto which said optical system projects an image of a first portion of said object zone; and

(2) a rearward zone onto which said optical system projects an image of a second portion of said object zone; said first portion of said object zone being located at a position forward of said second portion of said object zone relative to the movement of said craft along said flight path whereby said forward zone of said image plane receives a forward optical image of a forward portion of said object zone and said rearward zone of said image plane receives a rearward optical image of a rearward portion of said object zone;

(B) first transducer means for converting only said forward optical image into forward electrical signals representative of said forward portion of said object zone;

(C) second transducer means for converting only said rearward optical image into backward electrical signals representative of said rearward portion of said object zone; and

(D) signal processing means for processing said forward and backward electrical signals.

4,613,900

DIGITAL CODE READING APPARATUS AND METHOD

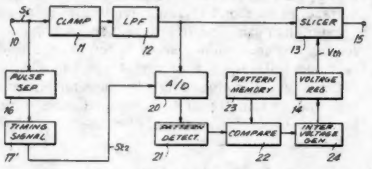
Osamu Matsunaga, and Hiroyuki Kobayashi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,163

Claims priority, application Japan, Dec. 20, 1982, 57-223211

Int. Cl.[4] H04N *7/167*; H03K *5/153*

U.S. Cl. 358—123 **8 Claims**



1. A television receiver for unscrambling a broadcast video signal scrambled in a predetermined manner by using a digital key code broadcast with the video signal and having a predetermined value representative of the manner of scrambling the broadcast video signal, the receiver comprising:

a key code reader for reproducing the predetermined value of the digital key code from the video signal which may be received by the receiver with an interference signal which changes a predetermined property of the broadcast signal and causes the levels of the received signal to change according to the change in the predetermined property thereby masking the broadcast key code, said key code leader including means for reading the received video signal by comparing levels thereof to the level of a threshold signal, sensing means for determining a change in said predetermined property and generating a control signal in response to said determining of a change, and threshold signal generating means for generating said threshold signal with said level of the threshold signal set in response to said control signal so that the key code read from the received video signal matches the broadcast key code;

decoding means for producing from said reproduced key code a decoding signal; and

unscrambling means for unscrambling the received video signal using said decoding signal; and wherein:

the predetermined property of the broadcast signal includes the waveform of a portion of the broadcast signal containing the key code;

said sensing means includes a comparing means for comparing the waveform of a corresponding portion of the received signal with a plurality of reference waveforms, each of which corresponds to a waveform produced by a known interference signal that may be superimposed on the broadcast signal, and generating said control signal with a value indicative of the particular reference waveform that matches the received waveform; and

said level of said threshold signal is determined by the value of said control signal.

4,613,901

SIGNAL ENCRYPTION AND DISTRIBUTION SYSTEM FOR CONTROLLING SCRAMBLING AND SELECTIVE REMOTE DESCRAMBLING OF TELEVISION SIGNALS

Klein S. Gilhousen, San Diego; Charles F. Newby, Jr., El Cajon, and Karl E. Moerder, Poway, all of Calif., assignors to M/A-COM Linkabit, Inc., San Diego, Calif.

Filed May 27, 1983, Ser. No. 498,800

Int. Cl.[4] H04N *7/167*; H04L *9/00*

U.S. Cl. 358—122 **26 Claims**

20. A communications system including a scrambler and a plurality of descramblers for respectively scrambling and selectively descrambling communications signals, comprising

means in each descrambler for providing a descrambler key signal that is unique to said descrambler;

means storing a list of said unique descrambler key signals for the descramblers of the system;

means storing a list defining a hierarchy of common category key signals corresponding to a hierarchy of address groups defined on the basis of descramblers having a common grade of service or other attributes that makes it desirable to address a group of descramblers in common;

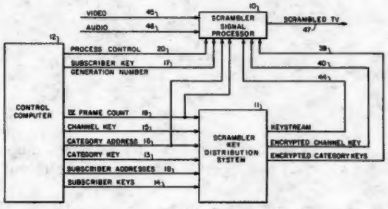
means for generating from said stored hierarchy list, a common category key signal corresponding to a selected address group in said hierarchy of address groups;

means for generating from said stored descrambler key signal list, a group of unique descrambler key signals corresponding to descramblers of said selected address group;

means in the scrambler for generating a group of unique encrypted category key signals individually addressed to different selected descramblers by processing said generated common category key signal in accordance with a first encryption algorithm upon said first algorithm being keyed by said generated group of unique descrambler key signals;

means in the scrambler for generating a unique keystream by processing an initialization vector signal in accordance with a second algorithm upon said second algorithm being keyed by either a said generated common category key signal or some other key signal;

means in the scrambler for scrambling a communications



signal in accordance with said unique keystream to provide a scrambled communications signal;

means for communicating said scrambled communications signal, said initialization vector signal, and said group of unique encrypted category key signals to said descramblers;

means in each descrambler for reproducing said common category key signal, when said descrambler receives a said unique encrypted category key signal address thereto, by processing said encrypted category key signal addressed to said descrambler in accordance with said first algorithm upon said first algorithm being keyed by said unique descrambler key signal provided in said addressed descrambler;

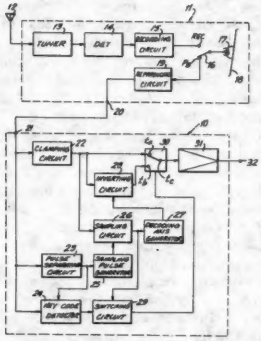
means in each descrambler for reproducing said unique keystream, when said common category key signal is reproduced in said descrambler, by processing said initialization vector signal in accordance with said second algorithm upon said second algorithm being keyed by either said common category key signal that is reproduced in said descrambler or a key signal that is reproduced in said descrambler in relation to said reproduced common category key signal, consistent with which key signal was used to key the second algorithm in the scrambler; and

means in each descrambler for descrambling said scrambled communications signal, when said unique encryption keystream is reproduced in said descrambler, by descrambling said scrambled communications signal in accordance with said unique keystream that is reproduced in said descrambler.

4,613,902
METHOD OF BROADCASTING AN ENCODED VIDEO SIGNAL AND A RECEIVING APPARATUS FOR DECODING THE SIGNAL

Shohi Ohmori, Tachikawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,816
Claims priority, application Japan, Feb. 23, 1983, 58-28879
Int. Cl.[4] H04N *7/167*
U.S. Cl. 358—124 **11 Claims**



1. A method of decoding a broadcast encoded video signal which comprises a scrambled portion encoded with reference to an encoding axis which is at a predetermined reference level prior to broadcasting the signal, and first and second identification signals in consecutive horizontal periods of the video signal at substantially the same identification level in both of said periods, with said identification level having a predetermined value relative to said reference level, the decoding method comprising the steps of:

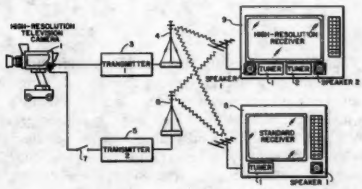
detecting said identification level of said second identification signal; and

generating a decoding axis at said reference level in response to said identification level of said second identification signal.

4,613,903
HIGH-RESOLUTION TELEVISION TRANSMISSION SYSTEM

Joseph S. Nadan, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,327
Int. Cl.[4] H04N *7/08*
U.S. Cl. 358—141 **14 Claims**



7. A television transmitter for transmitting a high-resolution television signal containing first picture information which, on display, forms first picture frames having a width which is wider than that of a standard aspect ratio, said high-resolution television signal being transmitted in the form of a first and a second transmission signal each having a format compatible

with a standard television receiver having said standard aspect ratio, each of said first picture frames comprising 1.5m scanning lines which are displayed in three 1.5n fields, where m is a number of scanning lines in a standard picture frame and n is a standard field frequency, characterized in that said television transmitter comprises:

means for generating said high-resolution television signal;

first means for converting said high-resolution television signal into said first transmission signal compatible with said standard television receiver and containing second picture information derived from said first picture information in said high-resolution television signal from at least two of said three 1.5n fields, the second picture information in said first transmission signal forming, on display, second picture frames each having m scanning lines and two n fields, said second picture frames corresponding to a selected portion of said first picture frames having said standard aspect ratio;

said first converting means also for converting said high-resolution television signal into said second transmission signal containing third picture information forming, on display, third picture frames having said standard aspect ratio and having m scanning lines and two n fields, the third picture information in said second transmission signal including said first picture information in said high-resolution television signal which, on display, forms the portion of said first picture frames not included within said selected portion of said first picture frames, the third picture information in said second transmission signal further including said first picture information in said high-resolution television signal which corresponds to said selected portion of said first picture frames, whereby the second and the third picture information in said first and said second transmission signals collectively represent substantially all of the first picture information in said high-resolution television signal;

means for modulating said first and second second transmission signals onto a first and a second carrier; and

means for simultaneously transmitting said first and said second carriers.

4,613,904

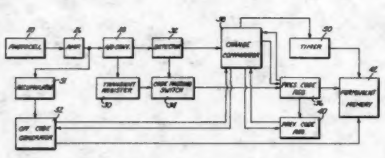
TELEVISION MONITORING DEVICE

Oscar M. Lurie, Bethesda, Md., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 15, 1984, Ser. No. 589,629

Int. Cl.[4] H04N *7/08*

U.S. Cl. 358—142 **8 Claims**



1. Television monitoring apparatus for monitoring reception status of a television receiver capable of selecting one of a plurality of transmitted wave signals each containing a channel identification signal, each of said wave signals representing a separate video channel, said television receiver having a display screen for displaying program material associated with a selected video channel, said television receiver being responsive to the channel identification signal of a selected wave signal for displaying channel identification information representative of the selected video channel at a predetermined location on said display screen, said monitoring apparatus comprising: a housing; means removably fastening said housing to said predetermined location on said display screen; photo-sensor means in said housing for reading said channel identification information currently being displayed; previous-code register means in said housing for storing a first channel identification word relating to channel identification information previously read by said photo-sensor means; memory means in said housing; and processor means in said housing responsive to said photo-sensor means and said previous-code register means for operating said memory means and said previous-code register means to store a current channel identification word relating to said currently displayed channel identification information read by said photo-sensor means which does not correspond to said first channel identification word stored in said previous-code register means.

4,613,905

VIDEO NOISE REDUCTION CIRCUIT HAVING IMPROVED TRANSIENT CHARACTERISTICS

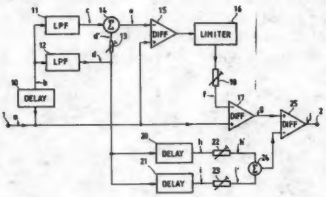
Yutaka Ichinoi, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 484,992, Apr. 14, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 800,105

Claims priority, application Japan, Apr. 15, 1982, 57-62814; Apr. 15, 1982, 57-62815; Apr. 15, 1982, 57-62816; Apr. 15, 1982, 57-62817

Int. Cl.[4] H04N *5/21*

U.S. Cl. 358—167 **3 Claims**



1. A noise reduction circuit having an input terminal to which a video signal is applied and an output terminal, comprising:

a noise rejection low-pass filter having a predetermined rise time for rejecting noise introduced in the video signal applied to said input terminal;

waveform shaping means comprising a second low-pass filter having a rise time smaller than said predetermined rise time and an attenuator connected in series therewith for generating an output signal having an uphill slope portion during a transition of the video signal from a first level to a second level and a downhill slope portion during a transition from said second level to said first level;

an adder for summing the output signal of the noise-rejection filter and the output signal of said waveshaping means;

a first differential amplifier having a first input terminal responsive to an output signal from said adder and a second input terminal;

means connecting the input terminal of the noise reduction circuit to said first and second low-pass filters and to the second input terminal of said first differential amplifier, said connecting means including delay means for introducing a delay so that a video signal applied to said first and second low-pass filters is advanced by an amount equal to said predetermined rise time with respect to a video signal applied to said second input terminal of said first differential amplifier;

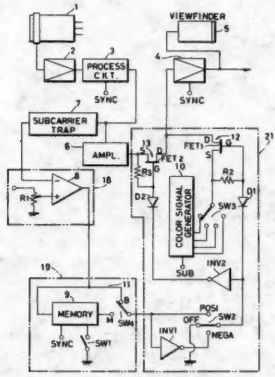
a limiter connected to the output of said first differential amplifier to detect small-amplitude noise; and

a second differential amplifier having a first input terminal responsive to said small-amplitude noise and a second input terminal responsive to the video signal applied to said input terminal of the noise reduction circuit for canceling noise in said video signal.

4,613,906
PICTURE COMBINING APPARATUS

Hiroaki Tanaka, Tokyo, and Ryuzo Motoori, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 548,204
Claims priority, application Japan, Nov. 4, 1982, 57-192521
Int. Cl.[4] H04N *7/08*
U.S. Cl. 358—183 **10 Claims**



1. A television camera comprising:

(a) image pickup means for dividing an image of an object into a given number of picture elements, converting each of said given number of picture element photoelectrically and generating a first picture signal indicative of a first object image;

(b) means for extracting from said first picture signal a luminance signal indicative of the luminance of each said given number of picture elements of said object image;

(c) means for comparing the level of said luminance signal with a predetermined threshold level, said comparing means being responsive to a difference in amplitude between the level of said luminance signal and said threshold level to convert said luminance signal to a binary signal representing one of two different levels;

(d) memory means for storing the binary signals generated from said comparing means;

(e) signal generating means for generating a second picture signal on the basis of said binary signals stored in said memory means; and

(f) means for combining said second picture signal generated by said signal generating means with a third picture signal indicative of a second object image generated by said image pickup means to form a composite image in which a part of said first object image is superimposed on said second object image.

4,613,907
FACSIMILE RECEIVER

Yoshio Yoshimoto, Aichi; Michiyoshi Washio, Shiga, and Chikayoshi Yazaki, Kyoto, all of Japan, assignors to Murata Giken Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 8, 1984, Ser. No. 638,724
Claims priority, application Japan, Aug. 10, 1983, 58-146990
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—257 **3 Claims**

1. A facsimile receiver for receiving picture information from a transmitter, said receiver comprising:

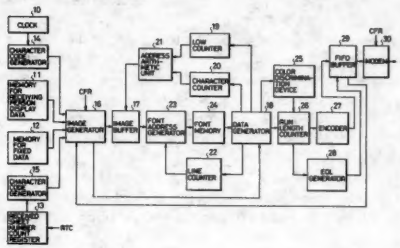
(a) means for storing receiving person display data identifying said receiver;

(b) a received sheet number counter for counting the number of received sheets of said picture information;

(c) a clock for measuring the receiving time;

(d) a character generator for reading the content of said means for storing receiving person display data, said received sheet number counter and said clock at the end of receiving said picture information and generating a character pattern signal corresponding to said content; and

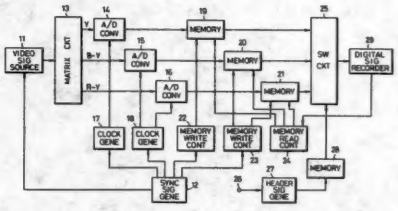
(e) transmitting means for encoding and modulating said character pattern signal and transferring said character pattern signal to said transmitter.



4,613,908
DIGITAL VIDEO SIGNAL REPRODUCING APPARATUS

Nobuaki Takahashi, Yamato; Seiichi Takashima, Ayase; Takeshi Shibamoto, Sagamihara; Koji Tanaka, Tokyo; Fujio Suzuki, Machida; Mitsuo Kubo, Yamato; Mitsuru Kikuchi, Yokohama; Hiroyuki Sugiyama, Isehara, and Yoshiaki Amano, Fujisawa, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Division of Ser. No. 485,054, Apr. 14, 1983, Pat. No. 4,520,401.
This application Aug. 16, 1983, Ser. No. 523,770
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—310 **16 Claims**



1. A digital video signal reproducing apparatus comprising:

reproducing means for reproducing a digital video signal from a recording medium, said recording medium being time-sequentially recorded with said digital video signal having a signal format in which a header signal is added to each of divided picture element data groups which are obtained by dividing a picture element data group in terms of a predetermined unit, said picture element data group being obtained by a digital pulse modulation of an analog video signal at a sampling frequency such that a product of a number of picture element data in one scanning line and a number of active scanning lines per frame in one picture of a standard television system is greater than 2^{17} but less than 2^{18} and closer to 2^{18}, said header signal at least comprising a synchronizing signal and a picture mode identification code;

a header signal reproducing circuit for detecting said header signal within the digital video signal reproduced by said reproducing means and for reproducing said header signal;

two memory circuits into which said picture element data group within said reproduced digital video signal is written, and from which a stored picture element data group is read out;

memory control means for selecting a write-in format with which said picture element data group is written into said memory circuits according to a value of said picture mode identification code of the header signal detected by said header signal reproducing circuit and for writing in said picture element data group into said memory circuits with the selected write-in format, and for reading out the stored picture element data group from one of said two memory circuits;

a digital-to-analog converting circuit for subjecting said picture element data group from said memory circuits to a digital-to-analog conversion and for obtaining said analog video signal; and

a circuit supplied with an output signal of said digital-to-analog converting circuit for producing an analog video signal in conformance with a standard television system.

4,613,909

VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

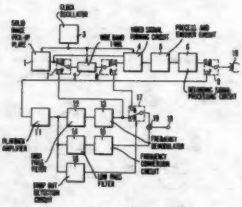
Kazumitsu Tobe, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,501

Claims priority, application Japan, Dec. 28, 1981, 56-213377

Int. Cl.[4] H04N *9/491*

U.S. Cl. 358—310 **23 Claims**



1. A video signal recording and reproducing system, comprising:

(a) image pick-up means for converting optical images to an electrical signal;

(b) separating means for separating color signals from the electrical signal obtained by said image pick-up means;

(c) forming means for forming a video signal which includes a luminance signal and a chrominance signal by using the color signals;

(d) recording means for recording the video signal on a recording medium;

(e) reproducing means for reproducing the video signal from the recording medium, said reproducing means including a processing circuit to handle the video signal;

(f) delay means for producing input signals with a predetermined period of delay; and

(g) changeover means for incorporating said delay means selectively into said separating means and said processing circuit.

4,613,910

STILL PICTURE TO TELEVISION SIGNAL CONVERSION SYSTEM

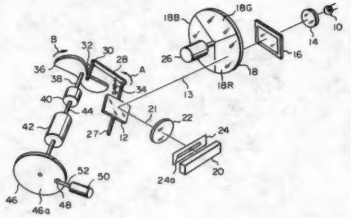
Mikio Utsugi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1983, Ser. No. 494,896

Claims priority, application Japan, Jun. 2, 1982, 57-94391

Int. Cl.[4] H04N *5/782, 5/781*

U.S. Cl. 358—310 **5 Claims**



1. A still picture to television signal conversion system for scanning a still picture to produce a video signal representative of the still picture, comprising:

image pickup means for scanning a still picture to form a video signal representative of the still picture;

a rotatable recording medium;

drive means for causing said recording medium to rotate;

said image pickup means including an image pickup device for scanning the still picture horizontally to form the video signal, and a vertical scanning mechanism for sweeping an optical beam impinging from the still picture on said image pickup device in the vertical direction of the still picture in synchronism with said drive means;

recording means connected to said image pickup means for recording the video signal on said recording medium;

reproducing means for reading the video signal out of said recording medium to reproduce the video signal; and

control circuit means for controlling said drive means to rotate said recording medium at a first speed, causing said image pickup means to scan the still picture in synchronism with the rotation of said recording medium, and causing said recording means to record the video signal on a predetermined recording unit of said recording medium;

said vertical scanning mechanism including separating means for separating in synchronization said vertical scanning mechanism from said drive means to stop the sweeping under the control of said control circuit;

said control circuit means controlling said separating means to stop the sweeping operation of said vertical scanning mechanism, further controlling said drive means to rotate said recording medium at a second speed, and causing said reproducing means to repeatedly reproduce the video signal which is stored in said recording means and represents one still picture;

the first speed being sufficiently lower than the second speed, with said second speed being in conformity with television signals.

4,613,911

PHOTOGRAPHIC FILM WITH MAGNETIC RECORDING TRACK AND METHOD OF RECORDING ON THE TRACK AND REPRODUCTION FROM THE SAME

Takahiro Ohta, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,835

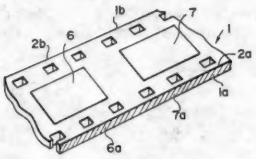
Claims priority, application Japan, Dec. 6, 1983, 58-230329

Int. Cl.[4] G03B *31/00*

U.S. Cl. 360—3 **1 Claim**

1. A method of magnetic recording on photographic film

having a magnetic recording layer coated on an edge surface of the film in the longitudinal direction thereof and magnetic reproduction from the same characterized in that a magnetic head is positioned with respect to said edge surface of the film



so as to establish a magnetic field in the direction of thickness of the film upon recording and so as to read a magnetic field in the direction of thickness of the film upon reproduction, with the magnetic head being kept spaced from the film, thereby accomplishing Y-direction recording or reproduction.

4,613,912

RECORDING AND REPRODUCING APPARATUS FOR A VIDEO TAPE RECORDER

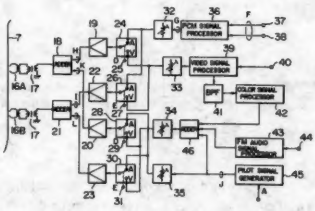
Akira Shibata; Atsushi Yoshioka, and Katsuyuki Watanabe, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,628

Claims priority, application Japan, Sep. 10, 1982, 57-156602; Nov. 1, 1982, 57-190846; Jan. 28, 1983, 58-11556

Int. Cl.[4] H04N *5/782*

U.S. Cl. 360—19.1 **15 Claims**



1. A recording and reproducing apparatus for video and audio signals having two magnetic heads disposed on opposite sides by 180 degrees of the rotation angle on a head rotation mechanism to form slanted recording tracks on a magnetic tape during a recording operation and for tracing the tracks during a reproducing operation, including:

means for wrapping and guiding the magnetic tape around said head rotation mechanism at larger than 180 degrees of the rotation angle so as to form a main track and an additional track, said additional track being formed in a period when said two magnetic heads simultaneously trace on said magnetic tape;

means for recording a time compressed audio signal on said additional track; and

means for recording a video signal on said main track; wherein said apparatus comprises:

means for compressing an input audio signal into a time compressed audio signal;

means for extracting a luminance signal and a carrier color signal from an inputted video signal;

modulation means for frequency modulating a carrier signal with said extracted luminance signal to produce a frequency modulation luminance signal;

means for converting the frequency of said extracted carrier color signal into another frequency lower than the frequency of said frequency modulation luminance signal to produce a lower frequency conversion carrier color signal;

means for generating a pilot signal having a frequency lower than the frequency of said lower frequency conversion carrier color signal, said pilot signal being used for control of tracking of the recording tracks during the reproducing operation;

means for recording on said main track, by said two magnetic heads, a first mixing signal produced by mixing said frequency modulation luminance signal, said lower frequency conversion carrier color signal and said pilot signal;

means for recording on said additional track, by said two magnetic heads, a second mixing signal produced by mixing said time compressed audio signal with said pilot signal, the time period of said time compressed audio signal being no longer than the period of said additional track; and

means for simultaneously supplying the same pilot signals to said two magnetic heads during recording on said additional track, said pilot signal recorded on the additional track being the same as the pilot signal recorded on the main track.

4,613,913

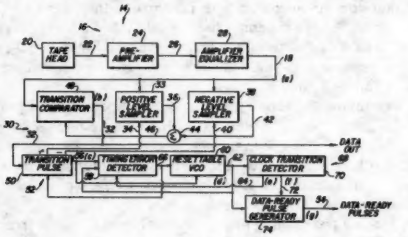
DATA ENCODING AND DECODING SCHEME

Alan C. Phillips, Los Altos, Calif., assignor to Etak, Inc., Menlo Park, Calif.

Filed Sep. 5, 1984, Ser. No. 648,002

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—51 **12 Claims**



1. Apparatus for decoding digital data stored on a data storage medium, the digital data including a NRZ data word having groups of n data bits, each group being stored over n consecutive bit cells, respectively, and including a clock information bit stored between said groups at every n+1 bit cell, comprising:

(a) means for reading the digital data stored on the data storage medium and for producing an analog signal corresponding to the n data bits and the clock information bit, wherein the analog signal has positive and negative levels;

(b) means for outputting the digital data in response to the analog signal, including

(i) means for generating a reference signal tracking the average of the positive and negative levels of the analog signal; and

(ii) means for comparing the analog signal with the reference signal and for generating output pulses upon transitions, respectively, of the analog signal going above or below the reference signal, the output pulses being the outputted digital data; and

(c) means, responsive to the digital data being outputted, for producing data-ready pulses at a time corresponding to the bit cells storing the n data bits and for inhibiting the data-ready pulses at a time corresponding to the bit cell storing the clock information bit.

4,613,914

AUTO-TRACKING METHOD AND APPARATUS OF A MAGNETIC RECORDING/REPRODUCING APPARATUS

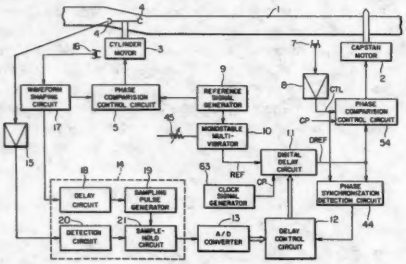
Yasunori Kobori, Yokohama; Hideo Nishijima, Katsuta; Kaneyuki Okamoto, Katsuta; Isao Fukushima, Katsuta; Katsuhiko Goto, Mito, and Takashi Takahashi, Katsuta, all of Japan, assignors to Hitachi Microcomputer Hitachi, Ltd. and Engineering, Ltd., both of Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 754,908

Claims priority, application Japan, Jul. 17, 1984, 59-146759

Int. Cl.[4] G11B *5/008*

U.S. Cl. 360—70 **9 Claims**



9. An auto-tracking method for controlling a run of a magnetic tape in a magnetic recording/reproducing apparatus of a helical scan type so that rotary magnetic heads accurately scan tracks on the magnetic tape, comprising the steps of:

changing the running phase of said tape at rough steps over a first predetermined tracking phase for detecting a first maximum envelope level of a reproduced signal recorded on said tape;

changing the running phase of said tape at fine steps over a second predetermined tracking phase range which is narrower than the first range and extends around a tracking phase corresponding to said first maximum envelope level, for detecting a second maximum envelope level of said reproduced signal; and

setting the running phase of said tape to a value corresponding to said second maximum envelope level.

4,613,915

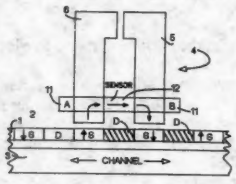
TWIN TRACK VERTICAL MAGNETIC RECORDING SERVO CONTROL METHOD AND APPARATUS WITH OFFSET VOLTAGE COMPENSATION

William G. Crouse, Raleigh, N.C.; Earl A. Cunningham, Rochester, Minn., and Albert W. Vinal, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1985, Ser. No. 787,875

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **7 Claims**



1. Vertical magnetic recording head position servo control apparatus, comprising:

a magnetic recording medium having at least one data track recorded thereon; and,

for each said data track, two parallely spaced apart servo tracks of opposite magnetic polarization to one another recorded on said medium; and

said servo tracks contain at least one segment each that have a full reversal and restoration of magnetic polarization within approximately equal halves of each said segment.

4,613,916

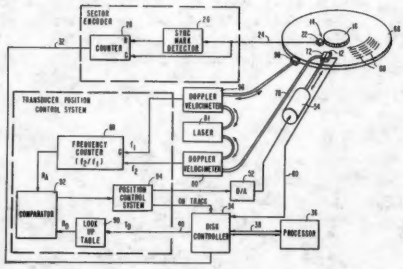
INFORMATION STORAGE DISK TRANSDUCER POSITION CONTROL SYSTEM REQUIRING NO SERVO PATTERN ON THE STORAGE DISK

Mark Johnson, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 566,942

Int. Cl.[4] G11B *21/08*; G01P *3/36*

U.S. Cl. 360—78 **11 Claims**



1. Information storage disk apparatus, comprising:

an information storage disk having a plurality of separate information storage tracks,

the location and path of each of said information storage tracks being defined by a discrete linear velocity;

means for storing the discrete linear velocity defining each of said tracks;

a transducer radially positionable over any desired one of said tracks for reading information from or writing information into any one of said plurality of information storage tracks;

means for rotating said disk;

linear velocity sensing means mounted at least in part for common movement with said transducer for sensing a linear velocity,

said linear velocity sensing means being responsive to the linear velocity of said disk at said transducer;

comparison means in communication with said storage means and responsive to said linear velocity sensing means for comparing the linear velocity sensed by said sensing means with the storage discrete linear velocity defining a desired track; and

control system means responsive to said comparison means for radially positioning said transducer such that said sensed linear velocity corresponds with the stored discrete linear velocity defining the desired track,

whereby said transducer is positioned over the desired track for reading information from or writing information into said desired track.

4,613,917

RECORDING AND REPRODUCING DEVICE

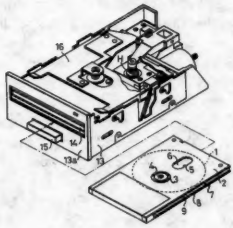
Motohiro Shimaoka, and Yukio Saito, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 23, 1983, Ser. No. 564,837

Claims priority, application Japan, Dec. 23, 1982, 57-193960[U]

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97 4 Claims



1. In a recording and reproducing device for a magnetic disk cartridge of the type having a frame, a cartridge insertion hole in said frame for insertion of a disk cartridge in a longitudinal direction therein, and an opening and closing projection disposed within said frame for engaging a shutter actuator projection disposed on the outside of disk cartridge for opening and closing a shutter of a magnetic head insertion hole formed in the cartridge,

the improvement comprising:

the disk cartridge having a groove defined in an exterior facing lateral edge extending along the longitudinal direction thereof, and said shutter actuator projection being longitudinally slidably disposed in said groove and projecting a first distance from a bottom portion of said groove in a direction transverse to said longitudinal direction of the disk cartridge;

said opening and closing projection being mounted in said frame for resilient contact with said bottom portion of said groove and extending in the transverse direction into the path of said shutter actuator projection so as to engage said shutter actuator projection when the disk cartridge is inserted in said cartridge insertion hole of said frame; and

a stopper member mounted in said frame and disposed adjacent said groove for preventing said opening and closing projection from being displaced in the transverse direction beyond a second distance smaller than said first distance when engaged by said shutter actuator projection.

4,613,918

PERPENDICULAR MAGNETIC PLAYBACK HEAD AND A PERPENDICULAR MAGNETIC RECORDING AND REPRODUCING DEVICE

Kenji Kanai, Neyagawa; Seishi Sasaki, Nishinomiya; Ken Takahashi, Suita, and Ryuji Sugita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,614

Claims priority, application Japan, Apr. 14, 1982, 57-62728; Apr. 14, 1982, 57-62731; Apr. 20, 1982, 57-66699; Oct. 14, 1982, 57-180720; Oct. 14, 1982, 57-180724; Oct. 14, 1982, 57-180721; Oct. 14, 1982, 57-180728; Oct. 14, 1982, 57-180730; Oct. 14, 1982, 57-180731

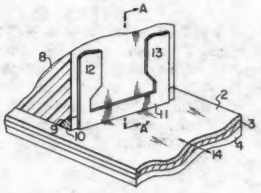
Int. Cl.[4] G11B *5/12, 5/30*

U.S. Cl. 360—113 22 Claims

1. A magnetic playback head for playback of recorded signals having maximum and minimum wavelengths from a double layered perpendicular magnetic recording medium including a high-permeability layer disposed on a base film and a high-coercivity layer with an axis of easy magnetization in the direction of its thickness disposed on said high-permeability layer, said playback head comprising:

magneto-resistive element means, with a thickness smaller than one-third of said minimum wavelength, said element means located in a plane substantially orthogonal to an operative surface of the head, said operative surface comprised of a surface facing said recording medium upon playback, said magneto-resistive element means having a longitudinal direction parallel to said operative surface, said magneto-resistive element means including one edge being exposed to said recording medium at said operative surface;

means for supplying a magneto-resistivity sensing current to said magneto-resitive element means, with a direction of said sensing current being substantially parallel to said longitudinal direction;



a high-permeability flux return yoke means, having at least two end portions, one end portion thereof being magnetically coupled to a side edge portion of said magneto-resistive element means furthest from said operative surface, and another end portion exposed to said operative surface, for forming, during playback and in close proximity to said magnetic recording medium, a substantially closed magnetic path with said magneto-resistive element means and said high-permeability layer of the recording medium; and

a non-magnetic separating means, located between a portion of said yoke means and a portion of said magneto-resistive element means with a portion of said separating means exposed to said recording medium, for defining a gap having a dimension between said magneto-resistive element means and said flux return yoke means, said dimension being greater than ten times said maximum wavelength.

4,613,919

MAGNETIC ERASING HEAD

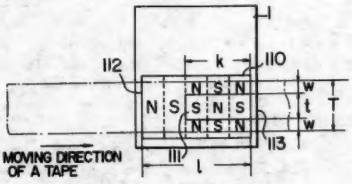
Norio Miyatake, Kobe; Mitsuaki Uenishi, Neyagawa; Nobuo Kashimura, Katano, and Keizo Ishiwatari, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 13, 1982, Ser. No. 449,225

Claims priority, application Japan, Dec. 15, 1981, 56-202712; Jan. 28, 1982, 57-12387

Int. Cl.[4] G11B *5/12*

U.S. Cl. 360—118 7 Claims



1. A magnetic erasing head comprising an erasing surface

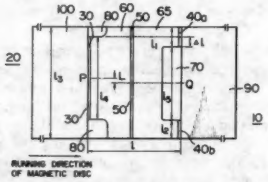
having an inlet side and an exit side for making sliding contact with an advancing magnetic recording medium, said surface comprising a permanent magnet material magnetized to include a series of portions disposed transversely relative to a recording track of said medium which have alternate polarities and which gradually decrease in magnetic intensity along a direction from said inlet side toward said exit side relative to an advancing direction of said medium with respect to said head, and a high permeability material embedded in at least one of said portions disposed on said exit side and having a predetermined length extending along said advancing direction, a width substantially equal to one-half of a width of said recording track of said medium and positioned substantially in alignment with a center of said recording track when said medium is moved past said head during an erasing operation.

4,613,920

MAGNETIC HEAD FOR MAGNETIC DISK

Shigemitsu Higuchi, Yokohama; Kazutoshi Konno, Yokosuka, and Tohru Sampei, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,269
Claims priority, application Japan, Jun. 9, 1982, 57-97635
Int. Cl.[4] G11B *5/265, 5/29*
U.S. Cl. 360—121 **8 Claims**



1. A magnetic head for use in a drive unit for driving a magnetic disk comprising:

an erase head which includes a first erase gap l_1 in width and a second erase gap l_2 in width placed on the extension of said first erase gap and at a distance l_5 therefrom; and

a read/write head placed adjacent to said erase head, said read/write head comprising a read/write gap having a width of l_4 which is larger than said distance l_5, said read/write gap being placed in parallel to and at a distance l from said pair of erase gaps on said erase head, said read/write gap having a portion Δl in width which overlaps said first erase gap, said width Δl being specified as

$$\Delta l \geq R_{min} - \sqrt{R_{min}^2 - l^2} ,$$

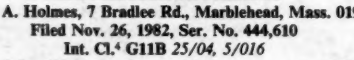
where R_{min} represents the track radius of the most internal track on a magnetic disk whereon a signal is recorded by said magnetic head, a midpoint of said read/write gap being linearly displaced a distance L from a midpoint set up between said first erase gap l_1 and said second erase gap l_2.

4,613,921

DISK MEMORY APPARATUS

William A. Holmes, 7 Bradlee Rd., Marblehead, Mass. 01945

Filed Nov. 26, 1982, Ser. No. 444,610
Int. Cl.[4] G11B *25/04, 5/016*
U.S. Cl. 360—133 **6 Claims**



1. A flexible magnetic recording disk apparatus comprising

(A) a substantially rigid disk hub having a first outer periphery,

(B) a substantially flat annulus of flexible self-supporting recording material having a central aperture therethrough with a second inner periphery less than said first periphery and contiguously overlying said hub with said inner periphery thereof substantially concentric with said hub outer periphery, and

(C) compliant tape means overlying said annulus and adhered thereto outwardly from said second periphery and overlying said hub and adhered thereto within said second periphery,

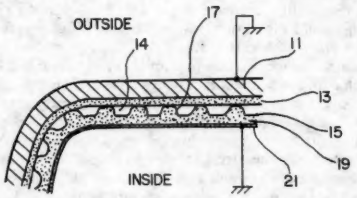
(D) whereby said tape means secures said annulus to said hub substantially at said second periphery and said annulus is supported by said hub to said larger first periphery and is relatively free to deflect away from said hub means between said first and second peripheries for enhancing read/write operation at track locations on said annulus proximal to said hub.

4,613,922

DOUBLE-GROUNDED WALL TANK, AND METHOD OF ITS MANUFACTURE

Werner Bachmann, Obfelden, Switzerland, assignor to Neo Vac Aktiengesellschaft, Oberriet and Adisa Service AG, Urdorf, both of, Switzerland

Filed Jan. 11, 1984, Ser. No. 569,988
Int. Cl.[4] H05F *1/02*
U.S. Cl. 361—215 **18 Claims**



1. Double-grounded wall tank, particularly for storage of potentially explosive or highly combustible substances such as gasoline, other petroleum products, volatile hydrocarbon solvents, acids, alkaline solutions and the like, having

a metal outer wall **(11)** which is electrically connected to ground;

an inner wall **(19, 21)**; and

a spacer foil **(15)** separating the outer and inner walls and defining therebetween a test chamber **(14)** to permit pneumatic supervision of fluid tightness of the outer and inner walls, respectively,

wherein, in accordance with the invention,

the inner wall comprises a composite layer including

a non-porous fiber-reinforced epoxy layer sprayed on the spacer foil spray-connected on the spacer foil **(15)** and bonded thereto;

and an electrically conductive inner resin layer **(21)** spray-connected on the non-porous fiber-reinforced epoxy layer and bonded thereto, said electrically conductive inner resin layer **(21)** being positioned at the inside of the tank for contact with the substance to be retained therein and electrically groundable to prevent build-up of static electricity thereon.

4,613,923

DIELECTRIC FLUID

Wolfgang Gunter, Wezembeek, Belgium, and Guido Nespoli, Milan, Italy, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 17, 1984, Ser. No. 661,962
Claims priority, application United Kingdom, Nov. 1, 1983, 8329134
Int. Cl.[4] H01G 4/22; H01B 7/00
U.S. Cl. 361—315 8 Claims

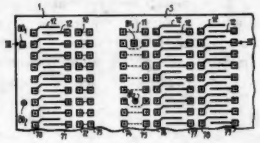
1. A capacitor comprising at least one layer of dielectric material in which that layer is impregnated with 1-phenyl-1-tetrahydronaphthyl-ethane or an alkyl substituted derivative thereof.

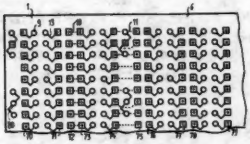
4,613,924

PRINTED CARD WITH IMPRESSIONS

Roland Brault, Antony, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 13, 1984, Ser. No. 671,093
Claims priority, application France, Nov. 15, 1983, 83 18133
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—403 6 Claims





1. An electronic circuit card, comprising:

a first external layer having a component face, a plurality of rows of conducting holes being formed therein, the rows being spaced apart by multiples of a predetermined constant pitch and disposed in a repetitive pattern;

second external layer having a wiring face;

at least two internal layers between said external layers;

a plurality of wiring studs, provided on said wiring face, each conducting hole being electrically connected to at least one wiring stud; and

a plurality of wiring tracks, provided on said component face, the holes of at least two adjacent rows being connected to respective wiring tracks.

4,613,925

SENSOR ATTACHMENT ASSEMBLY

Akira Mohri, Fukui, and Akira Oyama, Takefu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 2, 1984, Ser. No. 627,004
Claims priority, application Japan, Jul. 5, 1983, 58-122776
Int. Cl.[4] H05K 7/12
U.S. Cl. 361—420 2 Claims

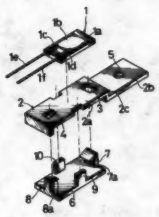
1. An assembly positioning an electronic circuit element comprising:

base means for mounting on one surface thereof said electronic circuit element;

at least a pair of apertures formed in said base means;

a supporting member disposed under the other surface of said base means opposed to said one surface carrying said electronic circuit element, said supporting member being made of an insulating material; and

hooked projections extending from said supporting member and positioned to cooperate with said pair of apertures, said hooked projections being provided with hooks coupling with the perimeter of said electronic circuit element;



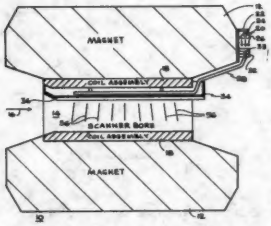
said hooked projections extend through said pair of apertures until said hooks are located above said one surface of said base means, and said hooks are coupled with the perimeter of said electronic circuit element to fasten said electronic circuit element to said base means.

4,613,926

FIBER OPTIC ILLUMINATING ASSEMBLY

Christopher J. Heitman, and Gregory D. Schwehr, both of Milwaukee, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 31, 1984, Ser. No. 666,859
Int. Cl.[4] F21V 7/04
U.S. Cl. 362—32 19 Claims



1. A device for illuminating a bore of an MR scanner apparatus, comprising:

light source means disposed remotely from the bore; and

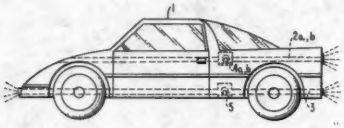
a fiber optic bundle made up of a plurality of optical fiber filaments operatively coupled at input ends thereof to said light source means, output ends of said optical fiber filaments extending into the bore of the MR scanner apparatus, said optical fiber filaments having different lengths such that predetermined ones of the filaments terminate at spaced intervals along a length of the bore, wherein light emanating from the output ends of said optical fiber filaments, when said light source means is energized, illiminates the bore.

4,613,927

ELEVATED SIGNAL INDICATOR FOR A MOTOR VEHICLE

Wilbur Brandt, 207 University Blvd., West, Silver Spring, Md. 20901

Filed Jun. 24, 1985, Ser. No. 748,179
Int. Cl.[4] F21V *8/00*
U.S. Cl. 362—32 **2 Claims**



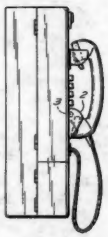
1. An elevated signal indicator for a motor vehicle, comprising, in combination, a reduced-size model of an automobile for being mounted on a rear deck inside a rear window of said motor vehicle; said model having a plurality of lights each of which shines in a location analogous to a position of corresponding lights on said motor vehicle; said lights comprising a brake and back-up signal light, a left turn signal light and a right turn signal light, and each one of said signal lights of said model comprising an electric lamp bulb within an interior of an elongated light tube extending between a front and rear ends of said model for directing light rays forwardly and rearwardly therefrom, an amber lens across a front end of said tube and a red lens across a rear end thereof; and each said lamp bulb of said model being in an electrical circuit with corresponding of said lights of said motor vehicle.

4,613,928

TELEPHONE STERILIZER

Friedrich Weinert, 219-19-131st Ave., Jamaica, N.Y. 11413

Filed Nov. 6, 1984, Ser. No. 668,719
Int. Cl.[4] H04M *1/22*
U.S. Cl. 362—88 **2 Claims**



1. A telephone sterilizer consisting of a base or base housing of the telephone apparatus is support for the bacteria destroying light and the light is so positioned with respect to the base such that when the handset is placed in the cradle for said handset the light is adjacent to the mouthpiece of said handset and directs bacteria destroying light toward said mouthpiece.

4,613,929

RETROFIT LOUVRE FOR LIGHTING FIXTURE

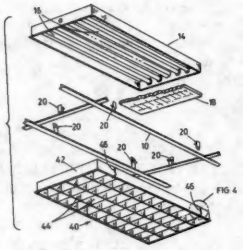
Thomas B. Totten, R.R. #4, Stouffville, Ontario, Canada L0H 1L0

Filed Jul. 6, 1984, Ser. No. 628,221
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—150 **3 Claims**

1. A troffer extension apparatus attachable to the side and end walls of a lighting troffer, and inter-engageable with structural ceiling tee portions of a ceiling system, whereby to raise the troffer relative to the ceiling, and comprising:

a plurality of extension members;

upper engagement means on one end of said members adapted to fit around and inter-engine with the lower edge of the side walls of said lighting troffer;



lower engagement clip portions on the other ends of said members engageable around opposite sides of upwardly directed portions of said ceiling tees; and,

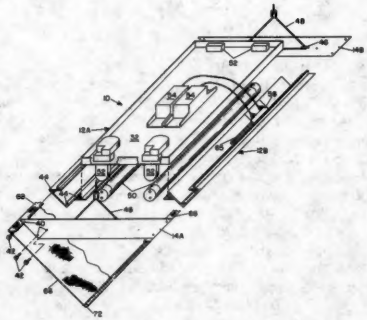
fastening means associated with said clip portions for fastening said clip portions together whereby to secure said clip portions to said upwardly directed portions of said ceiling tees.

4,613,930

CEILING LIGHTING FIXTURE AND SYSTEM

Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024

Filed Sep. 4, 1985, Ser. No. 772,649
Int. Cl.[4] F21S *3/00*
U.S. Cl. 362—223 **9 Claims**

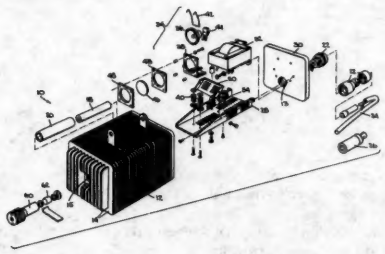


1. A ceiling lighting fixture comprising a rectangular frame having a pair of elongated side members and a pair of end plates, the side members being generally L-shaped in transverse cross section and of uniform cross section along their lengths and being oriented with the juncture between the legs lowermost and with the outer leg, with respect to the space within the frame, oriented obliquely to a plane that includes the junctures, a lamp socket mounting plate received on the frame and carrying sockets and lamps on the underside thereof, and a diffuser constituted by a rectangular strip of translucent fabric attached along each side to the upper free ends of the respective outer legs of the side members and hanging below the lamp socket mounting plate and the lamps.

4,613,931
PORTABLE FIBEROPTIC LIGHT SOURCE FOR USE IN HAZARDOUS LOCATIONS

Elmar K. Messinger, New York, N.Y., assignor to 501 Olympus Corporation, Lake Success, N.Y.

Filed May 24, 1984, Ser. No. 613,800
Int. Cl.[4] F21V *29/00, 7/04*
U.S. Cl. 362—373 **11 Claims**



1. A light source for use in hazardous environments, comprising:

a housing, having a longitudinal axis, including:

an input aperture; and,

a front surface having an output aperture therein;

a first plurality of cooling fins, disposed vertically, spaced apart, along said longitudinal axis of said housing, and having a first aperture therethrough disposed along said longitudinal axis of said housing;

a second plurality of cooling fins projecting from said front surface of said housing into an ambient atmosphere;

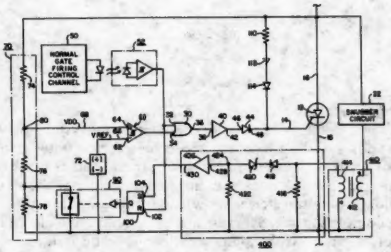
means, disposed within said first aperture, for illuminating said output aperture; and,

at least one flame path having a maximum length for a size of said housing.

4,613,932
METHOD AND CIRCUIT FOR REDUCTION OF STRESS IN THYRISTORS OPERATING IN THE INDIVIDUAL EMERGENCY FIRING MODE

Frank Cibulka, Monroeville, and Eric J. Stacey, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1985, Ser. No. 761,450
Int. Cl.[4] H02H *7/125*
U.S. Cl. 363—54 **47 Claims**



1. In a circuit comprising one or more thyristors connected in series forming a thyristor valve, means for providing a normal gate control signal to each thyristor for controlling the time of firing thereof, snubber circuit means connected in parallel with each thyristor for limiting the dv/dt transients and to ensure voltage sharing between the thyristors in the valve, and protection circuit means for providing an emergency gate control signal for firing an individual thyristor when the voltage applied thereto equals or exceeds a predetermined emergency voltage triggering level, a method for the reduction of stress in the individual thyristors and their associated snubber circuits and for the alleviation of problems associated with the decreased controllability of the valve due to sustained emergency firing, comprising:

initially firing a thyristor using the emergency gate control signal produced by the protection circuit when the voltage applied thereto equals or exceeds the emergency voltage triggering level;

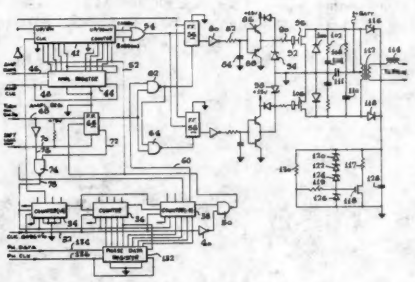
reducing the emergency voltage triggering level of the protection circuit; and

subsequently firing the thyristor using the emergency gate control signal produced by the protection circuit when the applied voltage equals or exceeds the reduced emergency voltage triggering level.

4,613,933
DIGITAL DRIVE SYSTEM FOR PULSE WIDTH MODULATED POWER CONTROL

Benjamin C. Shaw, Granada Hills, Calif., assignor to Allied Corporation, Morristown, N.J.

Filed Jan. 7, 1985, Ser. No. 689,135
Int. Cl.[4] H02H *7/22*
U.S. Cl. 363—55 **13 Claims**



1. A digital drive system for pulse width modulated power control including an output transformer, power amplifier means for driving said output transformer, load means connected to receive an a.c. output signal from said transformer characterized in that the drive system for said power amplifier means comprises first and second flip-flop circuits connected to said power amplifier means, gate means connected to said flip-flop circuits, a presettable up/down counter connected to said gate means, said counter including "CARRY" and "BORROW" output lines from said counter to said gate means, digital means containing a digital number defining the desired amplitude of the next cycle of said power amplifier means connected to provide an input signal to said presettable up/down counter, a clock connected to said presettable up/down counter providing output pulses at a frequency greater than the desired output frequency of said system by a desired multiple, counter means connected to said clock including a first divider having an output wherein said clock output is divided by a first factor of said multiple and a second divider having a first output wherein said first divider output is divided by two and having a second output wherein said first divider output is divided by four, means connecting said first output of second divider to an up/down terminal of said presettable up/down counter and to the "D" terminals of said flip-flops, means connecting the second output of said second divider to the reset terminal of said flip-flop, means connecting the inverse of the second output of said second divider to the reset terminal of said second flip-flop, a third output of said second divider

operative when both of said first and second outputs of said second divider are true serving as a preset load command to the presettable up/down counter connecting the digital number in said digital register to said presettable up/down counter whereby upon receipt of said command said presettable up/down counter will count clock pulses until the count of said presettable up/down counter overflows, causing said presettable up/down counter to generate a carry pulse to said gate means thereby causing said first flip-flop output to change state, means responsive to a change of state of said first output of said second divider to cause said presettable up/down counter to count down the counts representing said digital number at which time it generates a borrow count causing first flip-flop to return to its original state, following which said presettable up/down counter continues to count down until said second divider first output again changes state and said second output of said divider also changes state resulting in inhibiting said first flip-flop and enabling said second flip-flop to cause a repetition of the above cycle for said second flip-flop, said system continuing to repeat said cycles for a desired period of time.

4,613,934

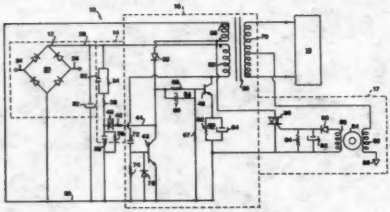
POWER SUPPLY FOR GAS DISCHARGE DEVICES

David R. Pacholok, 437 N. Crystal St., Elgin, Ill. 60120

Continuation-in-part of Ser. No. 590,868, Mar. 19, 1984, abandoned. This application Aug. 6, 1984, Ser. No. 637,916

Int. Cl.[4] H02M *7/537*

U.S. Cl. 363—131 **15 Claims**



1. A resonant supply circuit for generating high frequency, high voltage output to a gas-filled tube, comprising

a. a transformer having leakage reactance and including a primary winding, a feedback winding and a secondary winding connected to the gas-filled tube, the transformer having a large magnetic air gap,

b. a transistor having a base, an emitter and a collector, the collector being connected to the transformer primary winding and the base being connected to the transformer feedback winding to provide a base drive,

c. in which voltage on the base of said transistor causes said transistor to conduct, said voltage serving to cause said transistor to conduct until said transistor saturation voltage begins to rise sinusoidally,

d. circuit means connected to the base of said transistor to bias said transistor to delay application of conduction voltage to the base of the transistor until the collector voltage of the transistor is eliminated and to permit a rapid evacuation of charge carriers stored in the base-emitter junction of said transistor, and

e. switch means connected to said primary winding, said switch means being operable when said transistor saturation voltage rises sinusoidally to remove said voltage from the base of said transistor to render said transistor non-conductive, said switch means further providing a path for rapid evacuation of charge carriers stored in the base-emitter junction of said transistor to render said transistor rapidly non-conductive.

4,613,935

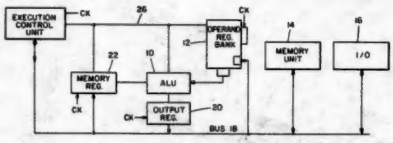
METHOD AND APPARATUS FOR PIPE LINE PROCESSING WITH A SINGLE ARITHMETIC LOGIC UNIT

John F. Couleur, 15181 Sobey Rd., Saratoga, Calif. 95070

Filed Feb. 2, 1983, Ser. No. 463,325

Int. Cl.[4] G06F *9/30, 9/38*

U.S. Cl. 364—200 **22 Claims**



1. A method of pipeline processing instructions with a processor system having a single arithmetic logic unit (ALU) comprising:

(a) interleaving the steps of address preparation and instruction execution performed by the single ALU such that address preparation for instruction N+1 occurs before execution of instruction N;

(b) fetching the index register contents, preparing the operand address and decoding instruction N during a first portion of the instruction fetch for instruction N+1; and

(c) interleaving the steps of instruction fetching and operand fetching from memory such that the operand fetch associated with instruction N is initiated during a second portion of the instruction fetch associated with instruction N+1.

4,613,936

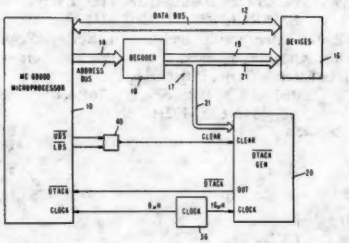
CENTRALIZED GENERATION OF DATA TRANSFER ACKNOWLEDGE PULSES FOR MICROPROCESSORS

Mark E. Andresen, Norwalk, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1983, Ser. No. 470,025

Int. Cl.[4] G06F *13/42*

U.S. Cl. 364—200 **2 Claims**



1. In a data processing system having a processor and a plurality of I/O devices interconnected by a bus system including an address bus with device access lines for carrying device access signals, a data bus and a control bus, said control bus including a first line means connected to said processor for providing a data transfer acknowledgment signal thereto indicating completion of a data transfer, and second line means for transferring data strobe signals indicating valid data on said data bus, in combination therewith a common data transfer acknowledgment signal generator for the plurality of I/O devices comprising:

timing means coupled to said second line and responsive to said data strobe signals thereon for generating a timed response signal at a point in time reflecting the response time of any particular one of the plurality of I/O devices involved the data transfer; and

logic means coupled to said timing means, said access lines

and said first for providing a data transfer acknowledgment signal in response to said timed response signal and an access signal for said any particular one of said plurality of I/O devices

wherein said logic means includes a plurality of gate means each responsive to an I/O device access signal on said address bus and to a timed response signal of said timing means to generate a data transfer acknowledgement signal on the concurrent receipt of said access and timed response signals and

wherein said timing means includes

delay circuit means providing a plurality of sequentially occurring timed response signals at different output terminals of said delay circuit means after being enabled by said strobe signals.

terminal means for selective coupling one of said output terminals of said delay circuit means to one of said gate means to select the timing of the data transfer acknowledgement pulse for any one of the plurality of I/O device means.

4,613,937

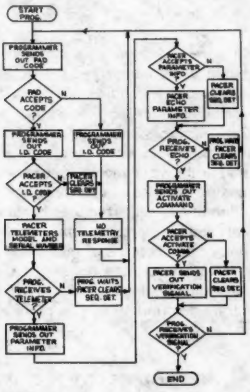
METHOD FOR EXTERNALLY PROGRAMMING A DEVICE IMPLANTED IN A PATIENT

John R. Batty, Jr., Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Feb. 22, 1984, Ser. No. 582,254

Int. Cl.[4] G06F *15/42*; A61N *1/36*

U.S. Cl. 364—413 **6 Claims**


START PROG.
PROGRAMMER SENDS OUT PACE CODE
PACE ACCEPTS CODE ?
PROGRAMMER SENDS OUT I.D. CODE
PROGRAMMER SENDS OUT I.D. CODE
PACER ACCEPTS I.D. CODE ?
PACER CLEARS SEQ. SET
PACER TELEMETERS MODEL AND SERIAL NUMBER
NO TELEMETRY RESPONSE
PROG. RECEIVES TELEMETRY
PROG. WAITS PACER CLEARS SEQ. SET
PROGRAMMER SENDS OUT PARAMETER INFO.
PACE ACCEPTS PARAMETER INFO ?
PACER ECHO PARAMETER INFO.
PROG. RECEIVES ECHO ?
PROG. WAS PACER CLEARS SEQ. SET
PROGRAMMER SENDS OUT ACTIVATE COMMAND
PACER ACCEPTS ACTIVATE CMD ?
PACER SENDS OUT VERIFICATION SIGNAL
PACER CLEARS SEQ. SET
PROG. RECEIVES VERIFICATION SIGNAL ?
END

1. In a process for programming a device implanted in a patient from an external programming unit, the improvement comprising the steps of:

transmitting, from an external source to the implanted device, a first digital access signal to enable a computer within the implanted device to receive a second access signal;

transmitting, from the external source to the implanted device, a second digital access signal to enable the computer to receive and store programming signals representing data;

inhibiting the computer from storing programming signals from the programming unit unless both the first access signal and the second access signal have been received in sequence;

transmitting the second access signal at a faster rate than the rate at which the first access signal is transmitted;

if the first and second access signals have been received in sequence, then transmitting from the implanted device indicia that programming may be commenced;

if the implanted device has transmitted indicia that programming may be commenced, then transmitting program data in digital form from the external programming unit to the computer within the implanted device;

if program data has been received by the computer, then transmitting from the implanted device indicia representing the program data that has been received;

if program data has been received by the computer, then activating selected computer output functions in response to said program data; and

if selected functions have been activated, then transmitting from the implanted device verification of such activation.

4,613,938

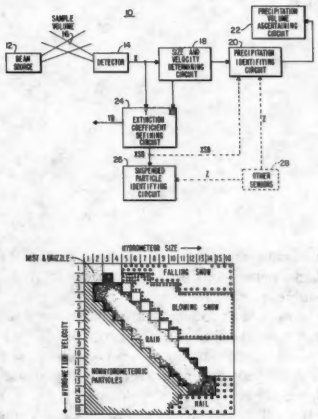
PRESENT WEATHER OBSERVING SYSTEM UTILIZING PARTICULATE SIZE AND VELOCITY MEASUREMENTS

Donald F. Hansen, Needham, and William K. Shubert, Acton, both of Mass., assignors to HSS Inc., Bedford, Mass.

Filed Jan. 25, 1985, Ser. No. 695,169

Int. Cl.[4] G06F *15/54*; G01W *1/00*; G01N *21/51, 15/02*

U.S. Cl. 364—420 **38 Claims**



1. A present weather observing system comprising:

means for providing a beam of radiation in the atmosphere;

means, having a field of view intersecting said beam to define a sample volume, for detecting scattered radiation from particles within said sample volume;

means for determining the size and velocity of at least one particle precipitating through said sample volume; and

means responsive to said means for determining size and velocity for identifying the type of precipitation.

29. A present weather observing system comprising:

means for providing a modulated beam of radiation in the atmosphere;

means, having a field of view intersecting said beam to define a sample volume, for detecting scattered radiation from particles within said sample volume and having at least one photoelectric element;

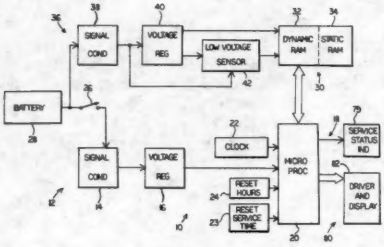
means, responsive to said detecting means, for determining size and velocity of at least one particle precipitating through said sample volume, said means for determining size and velocity including means for resolving a signal due to at least one precipitating particle from signals due to suspended particles and due to signal noise created by said detecting means; and

means, responsive to said detecting means and said means for determining size and velocity, for defining the atmospheric extinction coefficient.

4,613,939
PROGRAMMABLE SERVICE REMINDER APPARATUS AND METHOD

John C. Paine, Chardon, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Aug. 8, 1984, Ser. No. 638,922
Int. Cl.[4] G07C 5/10
U.S. Cl. 364—424 9 Claims



8. A programmable service reminder apparatus for a vehicle, said vehicle being controllably energizable from a vehicle power source, comprising:

sensor means for producing a digital control signal in response to said vehicle being energized;

clock means for producing a periodic time base signal;

service status indicator means for signaling an elapsed period of time;

a first Hall effect switch adapted to produce a digital service time reset signal in response to being exposed to a predetermined flux field;

programmable memory means for receiving and storing digital data; and,

processor means for receiving said digital control signal, said periodic time base signal and said digital service time reset signal;

repeatedly producing an incremental digital elapsed time signal in response to receiving said digital control signal and said periodic time base signal and periodically storing the instant digital elapsed time signal to said programmable memory means;

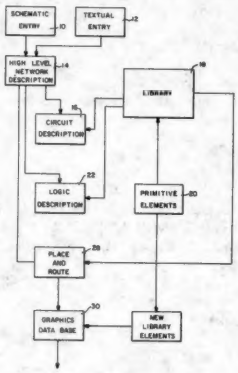
deenergizing said service status indicator means and sequentially producing a plurality discrete of predetermined digital service time signals in response to receiving said digital service time reset signal, the number of said predetermined service time signals produced being responsive to the period of time said service time reset signal in continuously received, combining the last stored digital elapsed time signal and the last produced predetermined digital service time signal to form a combined digital time signal, and responsively storing said combined digital time signal to said programmable memory means; and

repeatedly comparing the instant digital elapsed time signal and said stored digital combined time signal and energizing said service status indicator means in response to the instant elapsed time signal being greater than said stored combined time signal.

4,613,940
METHOD AND STRUCTURE FOR USE IN DESIGNING AND BUILDING ELECTRONIC SYSTEMS IN INTEGRATED CIRCUITS

Graham Shenton, Monte Sereno; Ioan G. Jones, Los Gatos; David W. Lucas, and Ronald E. Barton, both of Saratoga, all of Calif., assignors to International Microelectronic Products, San Jose, Calif.

Filed Nov. 9, 1982, Ser. No. 440,283
Int. Cl.[4] G06F 15/606
U.S. Cl. 364—490 2 Claims



1. A method for use in designing an integrated circuit layout on a semiconductor wafer comprising the steps of

providing an alterable description of a plurality of primitive elements including transistors, resistors, and conductors, said primitive elements being defined by surface dimensions, semiconductor construction, and surface layers, whereby said primitive elements can be assembled to form all structures for selected circuit functions,

designing a plurality of cell structures based on said primitive elements and on a predetermined grid structure, and

correlating circuit components of said integrated circuit to said cell structures and said primitive elements, whereby cell structures and circuit components are computer modified by altering descriptions of said primitive elements.

4,613,941
ROUTING METHOD IN COMPUTER AIDED CUSTOMIZATION OF A TWO LEVEL AUTOMATED UNIVERSAL ARRAY

David C. Smith, Williamstown, and Richard Noto, Maple Shade, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 2, 1985, Ser. No. 751,339
Int. Cl.[4] G06F 15/20
U.S. Cl. 364—490 13 Claims

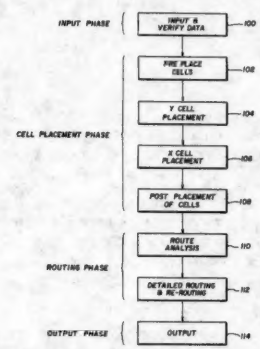
1. A method carried out by a computer for converting a multiple level metal universal array into a custom integrated circuit in which pre-placed basic units are arranged in parallel cell rows in a semiconductor device basic unit row region, with said cell rows being spaced apart by undefined wiring roadbeds adapted to contain conductors which run parallel to or perpendicular to the roadbeds on at least two intermediate levels of metallization separated by a dielectric layer and interconnected by selectively located vias, comprising the steps of:

(A) executing an input routine wherein input data for a predetermined integrated circuit design are entered into said computer;

(B) executing a cell placement routine which places said basic units in a predetermined configuration in said cell

rows of said basic unit row region so as to maximize the effectiveness of the subsequent conductor routing;

(C) executing a conductor routing routine for enhancing the success of conductor routing further comprising the steps of performing an initial route analysis process for the desired circuit design to determine in which roadbed each wire should be routed and eliminating certain projected wires for subsequent pathfinder routing under a predetermined set of criteria when the wiring density exceeds the available tracks in any given roadbed due to the fact that if said wires are not removed, the probability for 100% completion of conductor routing is minimum and thereafter performing a conductor routing process including a direct routing process which operates to route very short



wires of a predetermined class of wires, a channel routing process which operates to route most of the remaining wires while additionally eliminating certain wires from a roadbed for subsequent pathfinder routing under another predetermined set of criteria, also when the wiring density exceeds the available tracks in any given roadbed, and a pathfinder routing process which operates to route wires previously eliminated by said previous route analysis and channel routing process; and

(D) executing an output routine for converting cell placement and conductor routing data provided by steps (B) and (C) into respective customization masks for the levels of metallization and their interconnection vias as well as the contact level.

4,613,942

ORIENTATION AND CONTROL SYSTEM FOR ROBOTS

Richard M. Chen, 51-25 Goldsmith St., Elmhurst, N.Y. 11373

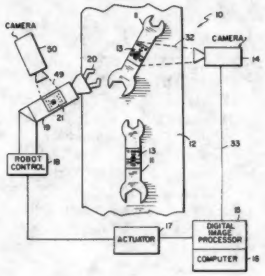
Continuation-in-part of Ser. No. 350,309, Feb. 19, 1982, abandoned. This application Oct. 22, 1984, Ser. No. 663,089

Int. Cl.[4] G06G *7/48;* **B25J** *19/00;* **G06F** *15/20*

U.S. Cl. 364—513 **26 Claims**

20. An orientation and control system for robots comprising;

a part having coded indicia on said part, said coded indicia being digital image processor recognizable; a camera being positioned so as to view the coded indicia; a digital image processor interconnected to said camera for recognizing the indicia image and further comprising a computer interconnected to said processor for decoding the indicia so as to provide an input signal; a robot having an arm for performing an operation with said part, and means to actuate said arm, said processor and computer providing said input signal to said actuating means for controlling the robot arm in relation to said operation on said part; and indicia application means comprising a projector with means to focus an image of said indicia on said part so that said camera can view said projected image; said projector being interconnected to said computer, so as to



provide computer input to the projector for indicia image projection on the part.

4,613,943

OPERATION TEACHING METHOD AND APPARATUS FOR INDUSTRIAL ROBOT

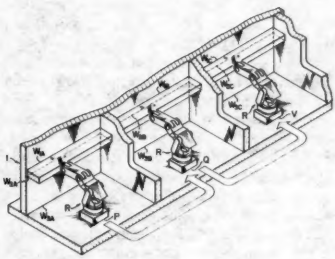
Norihisa Miyake, Ibaraki; Akira Tsuchihashi, Nagareyama; Osamu Fujiwara, Funabashi; Yasuhiro Hashimoto, Ibaraki, and Yutaka Maruyama, Ashikaga, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,472

Claims priority, application Japan, Apr. 13, 1983, 58-63593

Int. Cl.[4] G06F *15/46;* **G05B** *19/42*

U.S. Cl. 364—513 **18 Claims**



10. An operation teaching apparatus for an industrial robot adapted to be successively moved to and set at different positions along an objective structure to conduct a predetermined operation on working objects of the same configuration on said objective structure to which objects said different positions correspond, respectively, said apparatus comprising:

memory means for storing the content of a robot operation on the working objects taught to said industrial robot;

first computing means for obtaining correlation information between coordinate values of base references assumed on a first working object and coordinate values of comparison references assumed on a second working object, said coordinate values of the base references being stored in said memory means in terms of a first robot coordinate system assumed on said industrial robot set at a first position corresponding to said first working object, said coordinate values of the comparison references being stored in said memory means in terms of a second robot coordinate system assumed on said industrial robot in a second position corresponding to said second working object; and

second computing means for conducting, using said correlation information, correcting computation of coordinate values representing the taught operation of the robot and

stored in said memory means in terms of said first robot coordinate system to determine coordinate values representing said taught operation in terms of said second robot coordinate system.

4,613,944

ELECTRONIC TRANSLATOR HAVING REMOVABLE DATA MEMORY AND CONTROLLER BOTH CONNECTABLE TO ANY ONE OF TERMINALS

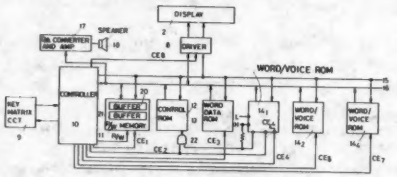
Shintaro Hashimoto, Ikoma; Masafumi Morimoto, Yamatokoriyama; Tosaku Nakanishi, Nara; Hideo Yoshida, Kashihara, and Shigenobu Yanagiuchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1981, Ser. No. 296,125

Claims priority, application Japan, Aug. 29, 1980, 55-120910

Int. Cl.[4] G10L *5/00*

U.S. Cl. 364—513.5 **3 Claims**



1. An electronic translator wherein a first word or words represented in a first language are entered to obtain a second word or words represented in a second language equivalent to the first word or words, comprising:

first memory means for providing signals representing the first word or words in the first language;

second memory means for providing signals representing the second word or words in the second language;

first control ROM means for processing the signals from the first and second memory means and operating the electronic translator, said first control ROM means being built into said translator;

second control ROM means for processing said signals from said first and second memory means and operating the electronic translator as a substitute for said first control ROM means, said second control ROM means being insertable and removable from operative association with said first and second memory means; and

circuit means for inhibiting the operation of said first control ROM means when said second control ROM means is inserted into operative association with said first and second memory means.

4,613,945

METHOD AND APPARATUS FOR CREATING FONTS FOR AN ELECTRONIC CHARACTER GENERATOR

Harry L. Parker, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 7, 1984, Ser. No. 607,556

Int. Cl.[4] G06F *15/40, 15/626*

U.S. Cl. 364—518 **7 Claims**

1. An apparatus for creating fonts to be stored in memory for use in a character generator of a dot matrix printer, comprising:

(a) means for creating a video image of a character,

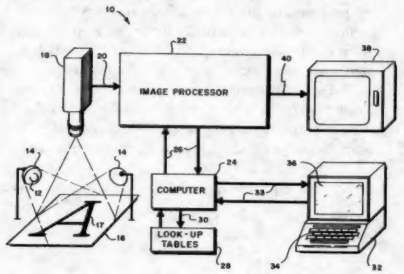
(b) means connected to said creating means for digitizing and storing in a first memory a representation of said character,

(c) means for converting said character representation in said first memory into a dot matrix font,

(d) means connected to said memory for displaying said dot matrix font,

(e) means connected to said first memory for modifying the number and location of dots and the shape of the dots in said dot matrix font, and

(f) means for storing said modified dot matrix font in a second memory;



(g) whereby, a dot matrix font can be producted having dots of a shape that simulates the printing characteristics of the printer in which the character generator is to be used.

4,613,946

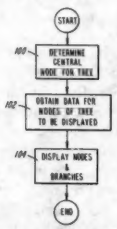
METHOD AND APPARATUS FOR GENERATING HIERARCHICAL DISPLAYS

Ernest H. Forman, 1438 Ironwood Dr., McLean, Va. 22101

Filed Jun. 7, 1984, Ser. No. 618,148

Int. Cl.[4] G06F *15/21*

U.S. Cl. 364—518 **26 Claims**



1. A method for displaying information in a tree structure on a system having an input means, a display means and a control means comprising the steps of:

(a) providing from said input means to said control means input data representative of information associated with a root of the tree structure forming a 0^{th} node level therein;

(b) providing from said input means to said control means input data representative of nodes on a K^{th} level in the tree structure where K is an integer;

(c) receiving input data from said input means representative of a relationship between said nodes on said K^{th} level and nodes related thereto on a different level K + L where L is a nonzero integer;

(d) repeating steps (b) and (c) until information concerning all nodes for display on the K^{th} level has been provided to said control means;

(e) operating said control means to generate control data for controlling said display means to display the nodes of said K^{th} level and to display connections representing branches of said tree structure between said nodes and the nodes related thereto on said different level whereby any displayed node is displayed together with its related nodes;

(f) repeating steps (b) through (e) as necessary for successive values of K to represent a tree structure on said display means; and

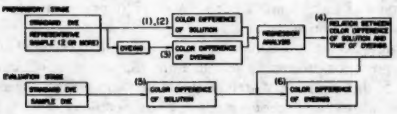
(g) displaying said nodes of said tree levels and said branch connections between said nodes and said related nodes, whereby a tree structure format is provided for displaying said input data.

4,613,947

METHOD OF MEASURING COLOR DIFFERENCE OF DYESTUFFS

Masakazu Suzuka, Ibaraki; Hiromu Ohashi, Sakai; Yukio Murata, Takatsuki, and Nobuyoshi Fujitsuka, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 6, 1984, Ser. No. 577,021
Claims priority, application Japan, Jun. 14, 1983, 58-107340
Int. Cl.[4] G01N *21/25;* G01J *3/50*
U.S. Cl. 364—526 5 Claims



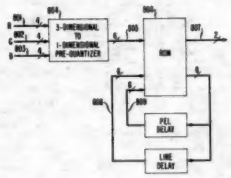
1. A method for measuring the color difference between a sample dye and a standard dye by testing the color properties of both dyes, which comprises the steps of isolating from dyes of the same family each of the coloring matter components having a dyeing affinity and having the possibility of existing in the dye; measuring the spectral absorbance or spectral transmittance of each component in solution form to obtain data 1 to be filed; selecting two or more dyes having such compositions that the proportions of the coloring matter components are different to some degrees from those of the sample dye, then quantitatively analyzing said prepared or selected dyes and a standard dye (a dye assumed to be a standard for comparison) for their coloring matter components; calculating the spectral absorbance or spectral transmittance of each of said prepared or selected dyes and said standard dye by the method of color mixing calculation in accordance with the composition of each dye using the results of above quantitative analysis and the filed data 1 of spectral absorbance or spectral transmittance of each coloring matter component; calculating the color difference in solution between each of said selected dyes and the standard dye; dyeing with said selected dyes and the standard dye to determine the color difference by colorimetry; determining statistically the numerical relationship between the color difference of dye solution and the color difference of dyeings to acquire data 2 (the data 1 and 2 being the base data to be collected in advance for the purpose of using in the subsequent evaluation of color); after collecting the foregoing data 1 and 2, analyzing quantitatively the sample dye for the coloring matter components; calculating the tristimulus values of the solution of sample dye from the results of said quantitative analysis and the spectral absorbance or spectral transmittance of each coloring matter component (data 1); calculating the color difference in solution from the calculated tristimulus values and the tristimulus values of the standard dye (which are determined previously or simultaneously); and converting the calculated color difference of solution into the color difference of dyeings by means of the determined relationship between the color difference of solution and the color difference of dyeings (data 2).

4,613,948

CONDITIONAL QUANTIZATION GREY LEVEL AND COLOR IMAGE CODING APPARATUS

Hamid Gharavi, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Jun. 1, 1984, Ser. No. 616,073
Int. Cl.[4] H04N *7/12, 1/40*
U.S. Cl. 364—526 19 Claims



13. Apparatus comprising,

means for receiving the red (R), green (G) and blue (B) component multilevel values associated with the pels of an image, each component value for each pel being one of a predetermined number of levels and each combination of component values (R, G and B) representing one of a first predetermined number of colors,

means for prequantizing as a three-dimensional unit the R, G and B components representing one of said first predetermined number of colors associated with each pel to a one-dimensional level value representing one of a second predetermined number of colors, said second predetermined number being less than said first predetermined number, and

means for quantizing the one-dimensional level value associated with each pel to one of a fewer than said second number of predetermined levels, said means for quantizing including means for quantizing in accordance with a particular quantization scheme that is determined for each pel by the one-dimensional level values associated with predetermined ones of its neighbors.

4,613,949

COMPOSITE PULSES FOR TIME REVERSAL IN NMR IMAGING

Gary H. Glover, Waukesha, Wis., and Matthew O'Donnell, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

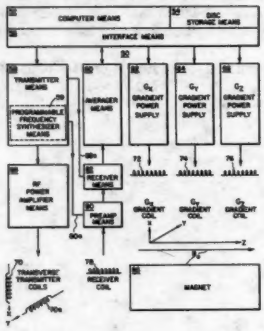
Filed Feb. 17, 1984, Ser. No. 581,150
Int. Cl.[4] G06F *15/52, 15/42*
U.S. Cl. 364—527 19 Claims

1. A method for providing an NMR image of a sample, comprising the steps of:

(a) applying to the sample an NMR imaging sequence which includes the step of applying to the sample a composite pulse which is formed of a sequence of a plurality of pulses each for producing an associated one of a plurality of rotations of the nuclear spins about substantially orthogonal axes in a selected transverse planar region to cause the nuclear spins to be time-reversed;

(b) detecting the resulting spin-echo NMR signals produced, responsive to the imaging sequence, by the nuclear spins at a plurality of different locations in the selected transverse planar region;

(c) processing the resulting detected spin-echo NMR signals to produce complex signals; and



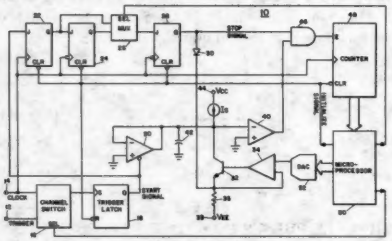
(d) forming the NMR image using the magnitudes of the complex signals.

4,613,950

SELF-CALIBRATING TIME INTERVAL METER

Daniel G. Knierim, and Lee J. Jalovec, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 22, 1983, Ser. No. 534,854
Int. Cl.[4] G04F *7/06*
U.S. Cl. 364—569 **25 Claims**



1. A circuit for calibrating a time interval meter by establishing a known time interval, where said time interval meter is operable for measuring time intervals between the receipt of a start signal and the receipt of a stop signal, said circuit comprising:

a clock signal generator having a constant and known frequency, said clock signal periodically alternates between a logic high state and a logic low state;

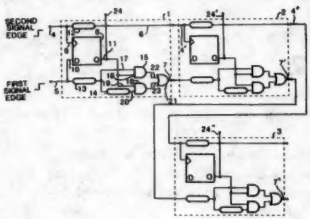
sequential latch means coupled to receive said clock signal, said start signal, and a select signal for outputting said stop signal after an elapsed time interval has passed subsequent to the receipt of said start signal, wherein said select signal selects between a first elapsed time interval and a second elapsed time interval where said second elapsed time interval is one clock period longer than said first elapsed time interval, and wherein said known time interval is equal to the time difference between said first and second elapsed time intervals.

4,613,951

TIME INTERVAL MEASURING APPARATUS AND METHOD

David C. Chu, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 11, 1984, Ser. No. 659,815
Int. Cl.[4] G04F *10/00*; H03K *5/159*
U.S. Cl. 364—569 **7 Claims**



1. A time interval measuring apparatus having a plurality of time shift cells in tandem for measuring a time interval between two signals, each of said plurality of time shift cells comprising:

first and second input ports for receiving respectively first and second signals;

a time detection means coupled to said first and second input ports for producing an indicating output signal indicative of the sequence of arrival of said first and second signals at said first and second input ports respectively;

a time shift means coupled to said first and second input ports and to said time detection means for selectively providing a predetermined synchronizing time delay to the earlier one of said first and second signals in response to said indicating output signal and thereby providing new first and second signals, and

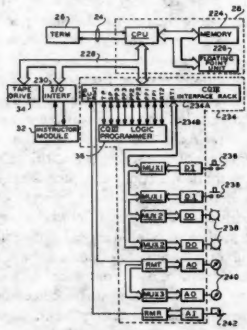
first and second output ports for coupling said new first and second signals out.

4,613,952

SIMULATOR FOR AN INDUSTRIAL PLANT

Richard C. McClanahan, Carrollton, Tex., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jul. 11, 1983, Ser. No. 512,809
Int. Cl.[4] G09B *9/00*; G05B *23/02*
U.S. Cl. 364—578 **34 Claims**



1. A simulator for simulating a multi-stage industrial plant controllable by a digital control and digital programmer for affecting plant operation, comprising:

a simulation console;

a plurality of indicators mounted on said console for produc-

ing an indication in response to display signals applied thereto;

a plurality of manually operable controls mounted on said console for producing manual signals;

programmable means coupled to said indicators for providing to them said display signals, said programmable means being coupled to said manually operable controls for receiving their manual signals, said programmable means including:

model means responsive to the manual signals of predetermined ones of said manually operable controls for providing a programmed array of processed values sized to simulate parameters existing during operation of said industrial plant, given ones of said array of values being applied to specified ones of said indicators for providing said indication; and

control means responsive to programmed ones of said array of values for modifying said array to an extent and in a manner determined by programming of said programmable means, said simulator further comprising:

digital programming means constructed the same as said digital programmer for affecting the programming of said programmable means to alter the operation of said control means.

33. In a method employing a simulator for alternatively simulating any one of a plurality of industrial plants having a digital programmer, the simulator having a plurality of console-mounted, replaceable indicators and manual controls detachably connected to a computer, the method comprising the steps of:

replacing corresponding ones of said indicators and manual controls to allow simulation of a selected one of said industrial plants;

installing in said simulator a digital programmer constructed as the one in said plant;

changing the programming of said computer by operating said digital programmer of said simulator;

reprogramming said computer to provide for said selected one of said plants a mathematical model responsive to said manual controls for producing at least one simulated operating parameter for display by said indicators; and

executing said programming to actuate said replaceable indicators in response to said manual controls as regulated by said mathematical model so that said selected one of said plants is simulated.

4,613,953

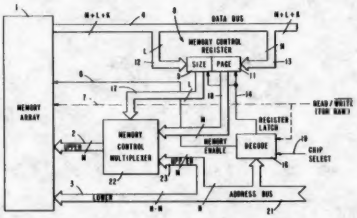
PAGING REGISTER FOR MEMORY DEVICES

John M. Bush, and David L. Ruhberg, both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 22, 1983, Ser. No. 487,554

Int. Cl.[4] **G06F** *12/06*

U.S. Cl. 364—900 **5 Claims**



1. An addressing control system for a memory array having a plurality of input address lines and a plurality of data lines, comprising:

a first set and a second set of said memory array input address lines;

a subset of address lines from the set comprising an address bus, connected directed to said first set of said memory array input address lines;

means for decoding the signals on the set of address lines comprising the address bus and gengerating a timing signal to signify the presence of page and size register data signals on the data lines;

a page register and a size register connected to the data lines and means for sensing and storing page and size register data signals on the data lines in response to the timing signal from said means for decoding;

means for generating address signals on a second set of address lines connected to the second set of said memory array input address lines, said means for generating providing the address signals in response to the page and size register data signals stored in the page and size registers or to address signals on another subset of address lines of the address bus; and

means responsive to the timing signal from the means for decoding for disabling the addressing operation of said memory array during the sensing of page and size register data signals on said data lines.

4,613,954

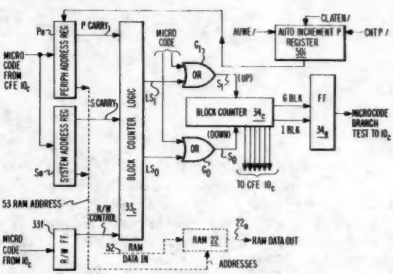
BLOCK COUNTER SYSTEM TO MONITOR DATA TRANSFERS

Jayesh V. Sheth, El Toro, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 442,159, Nov. 16, 1982, abandoned. This application Jul. 18, 1985, Ser. No. 756,563

Int. Cl.[4] **G06F** *3/00, 13/00*

U.S. Cl. 364—900 **14 Claims**



1. A system for monitoring and recording, on any clock cycle, the number "X" representing the number of blocks of data words in a buffer memory residing between a peripheral unit and a main host system, wherein N data-words constitute a full block of data words, said system comprising:

(a) said buffer memory means for temporary data-word storage, said buffer memory means connected to receive data-words from and to transmit data-words to, both said main host system and said peripheral unit;

(b) counter means receiving increment/decrement signal data for maintaining a current status number "X" which represents the blocks of data-words residing in temporary storage in said buffer memory means at any given clock cycle;

(c) block counter logic circuit means for generating block signal increment/decrement data to said counter means, said logic circuit means sensing the number of data-word blocks received by said buffer memory means and the number of data-word blocks transmitted from said buffer memory means, said logic circuit means including:

(c1) means to sense each operating cycle as being a Read or a Write operation by microcode signals from a microprocessor means;

(d) address register means for temporarily storing said buffer

memory means addresses received from said microprocessor means, and including:

(d1) system address register means connected to receive addresses when data-words are transferred either from said buffer memory means to said main host system, or from said main host system to said buffer memory means;

(d2) peripheral address register means connected to receive addresses when data-words are transferred either from the said buffer memory means to said peripheral unit or transferred from said peripheral unit to said buffer memory means;

(d3) and wherein each of said system and said peripheral address means generates a block-count signal to said logic circuit means when "N" data word locations in said buffer memory means have been addressed;

(e) said microprocessor means for selecting and concurrently executing data transfer routines using interleaving clock cycles for buffer-host transfers and buffer-peripheral transfers, said microprocessor means including:

(e1) means to generate said buffer memory addresses for temporary storage in said system and in said peripheral address register means;

(e2) means to generate Read/Write microcode signals to said logic circuit means;

(e3) means to sense the said number "X" in said counter means and to select data transfer routines on the basis thereof;

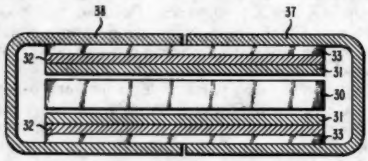
(f) said main host computer system connected to said microprocessor means and to said block counter logic circuit means for initiating data transfer operations.

4,613,955

BIAS MAGNET TEMPERATURE TRACKING OF MAGNETIC BUBBLE MEMORIES

Richard C. Sherwood; William J. Tabor, both of New Providence; Eva M. Vogel, Berkeley Heights, and Robert Zappulla, Lebanon, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 23, 1983, Ser. No. 535,249
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—27 **4 Claims**



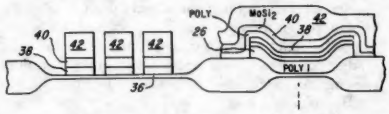
1. A magnetic bubble memory comprising a layer of a first magnetic material in which magnetic bubbles can be moved in the presence of a magnetic bias field and a magnetic bias field structure for supplying said bias field, said magnetic material being of a composition to require a bias field which changes nonlinearly over a given temperature range for maintaining magnetic bubbles in said layer over said range, said bias field structure being a multilayer composite comprising a plate of barium ferrite, a plate of polycrystalline rare earth garnet, and a plate of Ni-Cu alloy, said composite having a magnetic moment that increases with increasing temperature above its compensation temperature.

4,613,956

FLOATING GATE MEMORY WITH IMPROVED DIELECTRIC

James L. Paterson, and Roger A. Haken, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 23, 1983, Ser. No. 469,075
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **4 Claims**



1. A floating gate memory cell, comprising:

(a) a silicon substrate;

(b) a plurality of polysilicon insulated floating gates on said silicon substrate, said floating gates defining respective channel regions beneath said respective floating gates in the surface of said substrate;

(c) a plurality of polysilicon control gates over respective ones of said floating gates;

(d) a composite dielectric comprising both silicon nitride and silicon dioxide disposed between said control gates and said respective floating gates;

(e) a plurality of source and drain regions respectively separated by respective ones of said channel regions; and

(f) means for applying a write voltage to a selected one of said control gates,

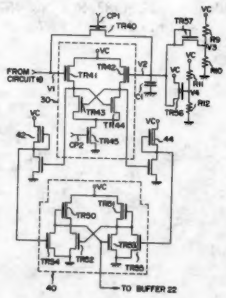
(g) said voltage being about 15 volts when said dielectric is about 400 angstroms, said voltage varying therefrom proportionally with the thickness of said dielectric.

4,613,957

SEMICONDUCTOR MEMORY DEVICE HAVING A SENSE AMPLIFIER CIRCUIT

Hiroshi Iwahashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 15, 1983, Ser. No. 514,350
Claims priority, application Japan, Jul. 26, 1982, 57/129809; Jul. 26, 1982, 57/129813; Mar. 31, 1983, 58/56076; Mar. 31, 1983, 58/56077; Mar. 31, 1983, 58/56096
Int. Cl.[4] G11C *7/00, 7/02;* G01R *19/00*
U.S. Cl. 365—189 **6 Claims**



1. A semiconductor memory device comprising:

memory means having a plurality of memory cells;

data transmission means for transmitting data from said memory means;

data detection means responsive to the data transmission

means for producing output data in accordance with the change in logic level of the memory data;

a sense amplifier circuit having a first input terminal and a second input terminal to receive data signals;

data supplying means governed by the data transmission means for supplying a data signal, said data signal having a potential corresponding to a first and second preselected potential level, respectively;

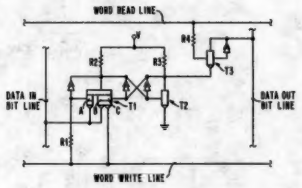
switching means operatively connected between the first and second input terminals of the sense amplifier to apply said data signal from the data supplying means to the first input terminal at times when said switching means is in its off condition and to the second input terminal at times when said switching means is in its on condition; and

potential setting means for setting the second input terminal of said sense amplifier circuit to a third preselected potential level at times when said data signal is at the first preselected potential level and to a fourth preselected potential level when the data signal is at the second preselected potential level, the third preselected potential level having a value between the first and fourth preselected potential levels, and the fourth preselected potential level having a value between the second and third preselected potential levels.

4,613,958
GATE ARRAY CHIP

Edward F. Culican, Hyde Park; Matthew C. Graf, Highland, both of N.Y., and Leonard C. Ritchie, Fontainebleau, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,426
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **21 Claims**



5. In an integrated circuit chip containing logical circuit means for performing at least one logical function and at least one monolithic memory for storing binary data, said logical circuit means and said at least one monolithic memory being interconnected, said memory comprising:

an array of memory cells having m columns and n rows, where m and n are positive integers and said memory array includes m×n memory cells, where each of said cells has the capacity to store one binary data bit and each of said n rows of memory cells has the capacity to store a binary word (or byte) of m binary bits;

m pairs of bit lines, each pair of bit lines comprising a data-in bit line and a data-out bit-line;

n pairs of word lines each pair of word lines comprising a word read line and a word write-line;

each of said m columns of memory cells being connected between the data-in bit line and the data-out bit line of a discrete one of said m pairs of bit lines;

each of said n rows of memory cells being connected between the word read line and the word write line of a discrete one of said n pairs of word lines;

data-in circuit means connected to said m data-in bit lines of said m pairs of bit lines;

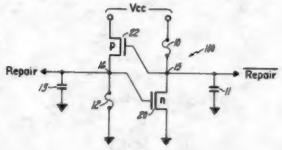
data-out circuit means connected to said m data-out bit lines of said m pairs of bit lines; and

control circuit means connected to said n pairs of word lines for reading data stored in said memory array and/or writing data into said memory array.

4,613,959
ZERO POWER CMOS REDUNDANCY CIRCUIT

Ching-Lin Jiang, Dallas, Tex., assignor to Thomson Components-Mostek Corportion, Carrollton, Tex.

Filed Jan. 6, 1984, Ser. No. 568,960
Int. Cl.[4] G11C *7/00*; H01J *19/82*; H03K *17/82*; G06F *11/00*
U.S. Cl. 365—200 **3 Claims**



1. In a CMOS semiconductor integrated circuit, a substantially zero-power consumption enabling/disabling circuit for switching at least one output node from a first voltage level to a second voltage level, comprising:

a first P-type transistor the channel terminals of which are connected between a power supply node and a first output node, and a first fuse connected between said first output node and a ground;

a first N-type transistor the channel terminals of which are connected between said ground and a second output node, and a second fuse connected between said second output node and said power supply node;

wherein said first P-type transistor has a first P-type gate electrode and means connecting said first P-type gate electrode to said second output node, so that said first P-type transistor is gated off by said power supply only when said second fuse is conductive; and said first N-type transistor has a first N-type gate electrode and means connecting said first N-type gate electrode to said first output node, so that said first N-type transistor is gated off by said ground only when said first fuse is conductive;

both of said first P-type and said first N-type transistors drawing no load current as long as both of said first and said second fuses are conductive, wherein said first output node is maintained substantially at ground potential and said second output node is substantially at power supply potential; and

said first P-type transistor maintaining said first output node substantially at said power supply potential and said first N-type transistor maintaining said second output node substantially at said ground potential when both of said first and said second fuses are non-conductive.

4,613,960
METHOD FOR CONSTRUCTING AND USING AN OPTIMAL PILOT TRACE IN SURFACE CONSISTENT STATICS ESTIMATIONS

David Hinkley, Dallas, and Keh Pann, Richardson, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

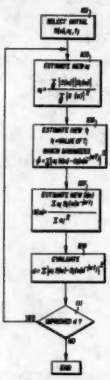
Filed Sep. 8, 1983, Ser. No. 530,322
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—51 **8 Claims**

1. A method for determining surface consistent statics estimates from gathered input seismic traces comprising the steps of:

recording acoustic wave signals from a plurality of sources as seismic input traces at a plurality of receiver locations;

gathering at least a portion of said recorded traces for source-receiver statics estimations;

constructing an optimal pilot trace from said gathered traces for use in statics estimations by



(a) selecting an initial pilot trace, and initial time shifts t_i and scale factors a_i associated with each of said gathered traces, where $i=1$ to the number of gathered traces;

(b) estimating new scale factors a_i where

$$a_i = \frac{\sum_w |S(w)|\ |S_i(w)|}{\sum_w |S(w)|^2}$$

from said initial pilot trace and said gathered traces;

(c) estimating new time shifts t_i from said new scale factors a_i, initial pilot trace, and said gathered traces;

(d) estimating a new pilot trace from said gathered traces, new estimated scale factors a_i and new estimated time shifts t_i;

(e) determining if said new estimated pilot trace is better than a previously estimated pilot trace in terms of minimizing the sum of Eucledian distances; and

repeating steps (b), (c), (d) and (e) with the most recently estimated pilot trace, scale factors a_i and time shifts t_i as substitutes for the initial pilot trace, scale factors a_i and time shifts t_i, respectively; said repetition occurring until the sum of Eucledian distances is minimized as determined in step (e);

using said constructed pilot trace to obtain source-receiver statics estimates for each of said gathered traces;

applying statics corrections to said gathered traces corresponding to said obtained source-received statics estimates;

gathering said statics corrected traces in a common depth point gather; and

stacking said common depth point gathered traces.

4,613,961

OPTICAL READER WITH A LIMITER IN THE TRACKING OR FOCUS ERROR SERVO CONTROL LOOP

Ronaldus M. Aarts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

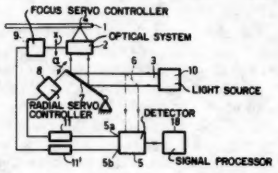
Filed Apr. 22, 1983, Ser. No. 487,781

Claims priority, application Netherlands, Jan. 27, 1983, 8300291

Int. Cl.[4] G11B *7/09, 7/16*

U.S. Cl. 369—44 **5 Claims**

1. An apparatus for reading an optical record carrier, which apparatus comprises an optical system for projecting a read beam so as to form a scanning spot on the record carrier, a read detector for detecting information contained in the read beam after it has cooperated with the record carrier, and a control circuit for controlling a control quantity which influences the scanning spot, which control circuit comprises means for generating an error signal, a servo control device for controlling the control quantity depending on said error signal, and a limiter which is arranged between the error signal generating



means and the servo control device, for limiting peak-shaped spurious signals in the error signal, said limiter comprising at least one control input for adjusting the limiting level depending on a control signal on said control input, and an amplitude detector, coupled to said control input, for supplying the control signal in dependence on the amplitude of the error signal.

4,613,962

TRACKING DEVICE WITH LINEAR MOTOR

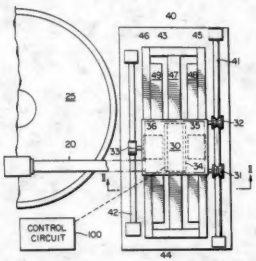
Yukio Inoue, Ichikawa, and Katsumi Mizunoe, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 6, 1983, Ser. No. 539,469

Claims priority, application Japan, Oct. 12, 1982, 57-178676

Int. Cl.[4] G11B *7/00, 21/02*

U.S. Cl. 369—44 **11 Claims**



11. Apparatus for tracking an optical head and the like along a radius of a planar recording disc, comprising

(a) a movable body having said optical head and the like attached thereto,

(b) means for supporting said body for movement in a plane parallel to said disc, said supporting means including guide means for guiding said body along a linear path parallel to said radius of said disc and means for mounting said body for movement on said guide means,

(c) linear motor means mounted on said support means for driving said body along said linear path, said linear motor means including electromagnet winding means to which direct current is applied and permanent magnet means, with one of said magnet means and said winding means being attached to said supporting means and the other of said magnet means and said winding means being fixed to said body, said magnet means and said winding means being disposed relative to one another such that the application of direct current to said winding means generates a thrust force tending to drive said body along said linear path, and

(d) means for magnetically urging said mounting means

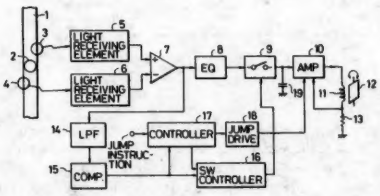
against said guide means in a direction normal to said plane.

4,613,963

TRACKING-SERVO DEVICE

Hiroyuki Hirano, Saitama, Japan, assignor to Pioneer Electronic Corporation, Saitama, Japan

Filed Jun. 27, 1983, Ser. No. 507,649
Claims priority, application Japan, Jun. 25, 1982, 57-109337
Int. Cl.⁴ G11B *21/08*
U.S. Cl. 369—44 **10 Claims**



1. In a reading device for reproducing information recorded in tracks on a recording disc, said device including a moveable transducer mechanism (11, 12, 13) that is subject to a restoration force when deflected and whose movement is controlled by a servo tracking means, said servo tracking means comprising:

a first means (5, 6) for detecting at least two tracking signals on said disc;

second means (7) responsive to said detected tracking signals for generating an error signal,

third means (10) proportionally responsive to said error signal for driving said moveable transducer mechanism orthogonal to said tracks,

fourth means (9) disposed between said second means and said third means that is adapted to be switched between a first position that transmits and a second position that blocks said error signal,

fifth means, (16) responsive to said error signal, for operating said fourth means (9) between said first and said second positions;

sixth means (15, 17, 18) responsive to an external command signal (A) to provide a jump drive signal to said third means (10), said sixth means operating selectively to provide drive signals and damp signals to said third means (10) and to control said fifth means (16) in its operation of said fourth means (9) to transmit or block said error signal from flowing between said second means (7) and said third means (10), the improvement comprising:

a signal generating means (8*b*, 19) for generating a signal effective to substantially cancel a restoration force exerted on said first means (5, 6).

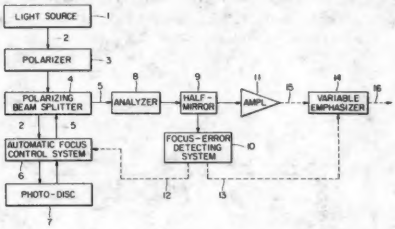
4,613,964

OPTICAL INFORMATION PROCESSING METHOD AND APPARATUS THEREFOR

Izumi Ichikawa, and Hideaki Sato, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,347
Claims priority, application Japan, Aug. 12, 1982, 57-140232
Int. Cl.⁴ G11B *7/09*
U.S. Cl. 369—45 **9 Claims**

1. An optical information processing method for information recording on or information readout from a recording medium by converging a light beam onto said recording medium, said method comprising controlling the signal wave form equalization characteristic upon said information recording or at said



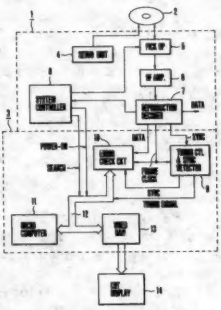
information readout, in accordance with the information on the state of focus of said light beam on said recording medium.

4,613,965

DIGITAL AUDIO DISC SYSTEM

Katsuya Hori, and Tsuneo Furuya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 460,595, Jan. 24, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,434
Claims priority, application Japan, Feb. 2, 1982, 57-15125
Int. Cl.⁴ G11B *31/00*
U.S. Cl. 369—59 **13 Claims**



1. In a digital audio disc system having a main channel for processing main program data consisting of audio signals and codes for error correction thereof, and a subchannel for processing additional data including display data corresponding to said main program data, said additional data being redundantly recorded on an audio disc so that the same additional data occurs at least twice at corresponding locations on the disc: Apparatus for controlling a display corresponding to said display data included in said additional data to appear only when said additional data is valid, comprising the combination of

reproducing means for reproducing said main program data and said additional data from said disc;

error check means for collating the redundantly recorded additional data as reproduced and for generating a control signal indicative of the validity of said collated reproduced additional data in response thereto;

display means; and

display control means for controlling said display means in response to said control signal to present said display corresponding to said display data included in said reproduced additional data only when said control signal indicates that said reproduced additional data is valid.

4,613,966

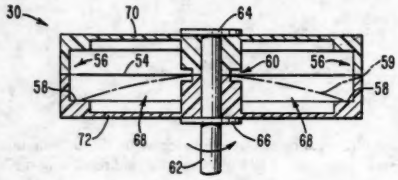
SEALED ENCAPSULATION FOR FLOPPY DISK USING CENTRIFUGAL FORCE TO FLATTEN DISK

Thomas H. Di Stefano, Bronxville, and Robert Sadofsky, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,741

Int. Cl.[4] G11B *23/033, 17/32*

U.S. Cl. 369—100 **10 Claims**



1. In combination, a floppy optical disk and a sealed protective housing for said disk through which an optical beam from an optical system can pass for writing information onto said disk and reading information from said disk, said protective housing comprising in combination:

first and second sections adapted to be brought together in a substantially air-tight seal to securely hold said floppy optical disk therebetween and to create a hollow space in which said floppy disk can flatten by centrifugal force when said floppy disk and said housing are rotated as a single unit, there being no relative motion between said disk and said protective housing during their rotation,

said first and second sections being comprised of a material which is optically transparent to said optical beam and being sufficiently thin and flexible that said first and second sections can distort when being rotated, said first and second sections together forming a structure having a central hub portion to which a drive mechanism can be fastened for rotating as a single unit said housing and said secured floppy disk, said central hub portion holding said disk at its inner diameter, the outer diameter of said disk being unsecured and out of contact with said sections during rotation of said housing and disk,

there being peripheral support means at the periphery of said housing for increasing the rigidity of the periphery of said housing, and central support means for giving rigidity to the central hub of said housing and for holding said floppy disk, and

wherein the surface of said housing through which said optical beam passes is out of focus in the optical system used to provide said optical beam.

4,613,967

DISC PLAYER

Yuichiro Hamada; Kazuhiko Fujiie, both of Tokyo; Masanori Ohtawa, Kanagawa; Chiaki Nonaka, Kanagawa; Tadao Yoshida, Kanagawa, and Yoshiaki Haneda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

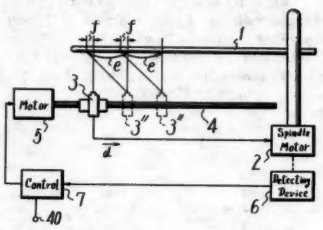
Filed Apr. 27, 1982, Ser. No. 372,125

Claims priority, application Japan, Apr. 30, 1981, 56-65656

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—221 **9 Claims**

1. An apparatus for intermittently reproducing less than the total extent of information signals recorded in substantially concentric tracks on a rotatable record disc; and said apparatus comprising pick-up means operative, upon scanning of a track of said record disc while the latter is rotated, to reproduce the information signals recorded in the scanned track; driving means for rotating said record disc relative to said pick-up means; transporting means for radially moving said pick-up means in either radial direction in respect to the axis of rotation of the record disc and thereby determining which one of said tracks is to be scanned by said pick-up means; tracking means having a predetermined effective range for controlling the scanning of said tracks by said pick-up means; and control means selectively operative in a normal operating mode for causing said pick-up means to scan successive tracks while



remaining within said effective range to reproduce the information signals therein, and in a high-speed operating mode to periodically exceed said effective range and thereby to cause said pick-up means to intermittently scan nonadjacent groups of said tracks so as to intermittently reproduce only the information signals recorded in said nonadjacent groups of tracks.

4,613,968

DISK DRIVE MECHANISM

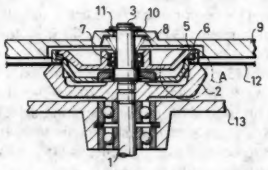
Masao Okita, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Mar. 21, 1985, Ser. No. 714,374

Claims priority, application Japan, Mar. 21, 1984, 59-39071[U]

Int. Cl.[4] G11B *5/16, 3/62*

U.S. Cl. 369—270 **2 Claims**



1. A disk drive mechanism comprising:

(a) a motor-driven shaft;

(b) a spindle mounted on said motor-driven shaft and including an annular wall having a support surface;

(c) a flexible hub mounted on said motor-driven shaft and composed of a plurality of segments including a radially outward flange, said support surface and said segments coacting to center a floppy disk with respect to said motor-driven shaft, said support surface and said radially outward flange coacting to clamp the floppy disk therebetween;

(d) a collet mounted on said motor-driven shaft in fitting relation to said flexible hub through a resilient O-ring and having a radially outward flange having a circumferential surface; and

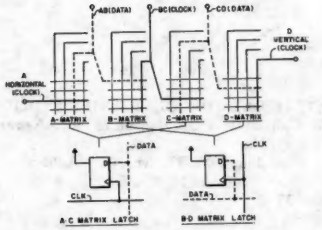
(e) the resilient O-ring interposed between a surface of said flange of said flexible hub and said circumferential surface of said collet.

4,613,969

METHOD FOR CONTROLLING A MULTISTAGE SPACE SWITCHING NETWORK

Johannes Draayer, Scottsdale, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Nov. 5, 1984, Ser. No. 668,342
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 12 Claims



1. In a space switching network, a method for controlling a multistage network comprising the steps of:

selecting an idle path from a plurality of paths through a plurality of switching matrices of said space switching network;

said step of selecting an idle path including the steps of:

selecting a path through said plurality of switching matrices; and

testing map indicators, associated with each switching matrix, to determine whether said selected path through said switching matrix is idle;

said method for controlling a multistage network further including the steps of:

iterating said steps of selecting a path and testing map indicators until an idle path through each of said plurality of switching matrices has been determined;

marking said map indicators of said determined idle path to indicate said idle path as being presently busy;

formulating a plurality of parameters corresponding to said selected idle path through each said switching matrix;

said step of formulating including the steps:

setting logic one in bit positions of a plurality of parameter words corresponding to said selected idle path through each of said switching matrices; and

writing said plurality of parameter words into a corresponding plurality of parameter registers; said method for controlling a multistage network further including the steps of:

transmitting a first set and a second set of said formulated parameters from a plurality of register means, said first and second sets of said parameters corresponding to said selected idle path;

generating a plurality of horizontal and vertical control signals from said first and second sets of transmitted parameters; and

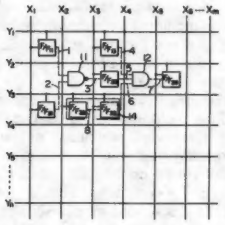
simultaneously operating at least one D-type latching means of each switching matrix in response to said generated horizontal and vertical control signals to establish a physical signal connection from an inlet of a first switching matrix to an outlet of a last switching matrix.

4,613,970

INTEGRATED CIRCUIT DEVICE AND METHOD OF DIAGNOSING THE SAME

Ikuro Masuda; Hideo Maejima; Terumine Hayashi, and Kazumi Hatayama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,706
Claims priority, application Japan, Feb. 4, 1983, 58-16045
Int. Cl.[4] G01R *15/12*
U.S. Cl. 371—25 10 Claims



1. A method for testing an integrated circuit having a plurality of combinational circuits, a plurality of input memory circuits and a plurality of output memory circuits, wherein said combinational circuits, said input memory circuits and said output memory circuits are arranged so that each combinational circuit has an input memory circuit coupled to an input thereof and an output memory circuit coupled to an output thereof, said method comprising:

(a) selectively storing diagnostic input data to be used in diagosing a predetermined combinational circuit to be tested in a predetermined input memory circuit coupled to an input of said predetermined combinational circuit;

(b) operating said predetermined combinational circuit to be tested to perform a predetermined operation on said diagnostic data stored in said predetermined input circuit;

(c) storing the results of said predetermined operation of said predetermined combinational circuit as diagnostic output data in a predetermined output memory circuit coupled to an output of said predetermined combinational circuit; and

(d) selectively reading out said stored diagnostic output data from said predetermined output memory circuit.

4,613,971

TRANSVERSELY EXCITED GAS LASER

Gerhard Brumme, Eching; Ludger Grage, Eichenau; Hinrich Heynisch, Gräfelfing, and Erwin Hübner, Grafing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,179
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313811
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 16 Claims

1. Transversely excited gas laser, comprising:

an elongated gas-filled discharge chamber having an optical axis;

a main cathode electrode and a main anode electrode extended along said optical axis in said discharge chamber defining a main discharge space between said main cathode and main anode electrodes through which said optical axis extends, said main electrodes bordering two sides of said main discharge space leaving two other sides open.

at least one pair of auxiliary electrodes each being extended parallel to said optical axis in vicinity of a respective one of said open sides of said main discharge space and mutually spaced apart by a given distance, each of said auxiliary electrodes including a conductor and a dielectric shell surrounding said conductor, each of said auxiliary electrodes being spaced from all of the other electrodes by a set breakdown distance; and

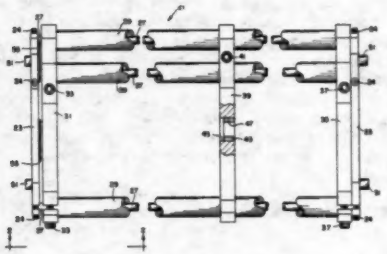
a driving unit connected to said electrodes, said driving unit supplying different potentials to said main cathode and main anode electrodes producing a main electric discharge therebetween during operation of the gas laser, and said driving unit supplying different potentials to said pairs of auxiliary electrodes causing a corona discharge preionizing the gas in said main discharge space to take place therebetween across said given distance during operation of the gas laser.

4,613,972

RESONANT CAVITY STRUCTURE FOR ION LASER WITH FLOATING PLATE FOR MIRROR ADJUSTMENT

Ralph B. Bettman, Mountain View, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed May 9, 1984, Ser. No. 608,603
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—107 **7 Claims**



1. A resonant cavity apparatus for a laser of the kind having a mirror at each end of the cavity, said resonant cavity apparatus comprising,

a first mirror mounting plate,

a second mirror mounting plate,

structure means for holding the first mirror mounting plate in fixed position at one end of the cavity,

said structure means having a far end positioned adjacent the second mirror mounting plate,

graphite rod means connected in fixed relationship to the first mirror mounting plate and extending through the structure means and having ends connected in fixed relationship to the second mirror mounting plate and being continuous from the first mirror mounting plate to the second mirror mounting plate, for holding the first and second mirror mounting plates a highly stable longitudinal distance apart over the range of temperature variation encountered in operation of the laser, and wherein the far end of the structure means is movable with temperature variation in a longitudinal direction with respect to the mirror mounting plates and with respect to the graphite rod means, and

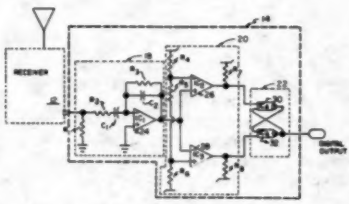
connector means for connecting the second mirror mounting plate to the far end of the structure means so as to permit said relative longitudinal movement of the far end with respect to the second mirror mounting plate while preventing any rotational or lateral movement of the second mirror mounting plate with respect to said far end of the structure means.

4,613,973

DIGITAL DATA DECODER AND METHOD

Warren J. Dahl, Midvale, Utah, assignor to Eaton-Kenway, Inc., Salt Lake City, Utah

Filed Jun. 20, 1985, Ser. No. 746,695
Int. Cl.[4] H04L *27/00*
U.S. Cl. 375—37 **20 Claims**



1. Apparatus for communicating digital data by radio frequency comprising:

first site means generating digital data;

second site means, remote from the first site means, utilizing digital data corresponding to the digital data of the first site means;

the first site means comprising radio frequency transmitter means superimposing the digital data from the first site means upon a carrier waveform to create and transmit a composite sinusoidal wave form containing said digital data;

receiver means comprising the second site means remote from the radio frequency transmitter means receiving and processing said composite sinusoidal waveform;

said receiver means comprising means which demodulate a base band signal from the composite waveform;

means to which the base band signal is communicated, said last mentioned means creating positive and negative voltage spikes each time the base band signal goes positive and negative, respectively;

means at first and second comparator sites to which said voltage spikes are communicated;

means at each comparator site comparing the voltage of said spikes to a predetermined voltage level, the comparison at the two sites being of opposite polarity, respectively;

means at each comparator site normally issuing a constant known voltage signal and means interrupting said constant voltage signal when any said voltage spike exceeds the predetermined voltage level, either in the positive or in the negative, depending on the site;

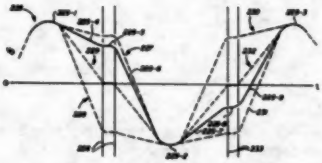
means which receive the two interrupted voltage signals and combine the two interrupted voltage signals into a single output digital signal.

4,613,974

METHOD AND SYSTEM FOR MODULATING A CARRIER SIGNAL

Peter R. Vokac, 7835 N. Avenida de Carlotta, Tucson, Ariz. 85704, and Richard C. Gerdes, 4645 E. Quivira, Tucson, Ariz. 85718

Filed Mar. 16, 1984, Ser. No. 590,281
Int. Cl.[4] H03K 7/00, 9/00
U.S. Cl. 375—37 66 Claims



1. A method of modulating a carrier signal, comprising the steps of:

(a) changing the slope of the first occurring one of the upper and lower portions of a first transition of said carrier signal to a first value in response to an input signal; and

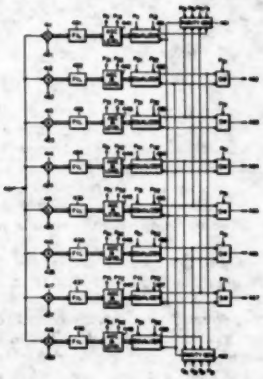
(b) changing the slope of the second occurring one of said upper and lower portions to a second value in response to said input signal, such that the ratio of one of said first and second values to the sum of said first and second values is representative of an input level of said input signal.

4,613,975

SELECTIVE FADING PROTECTION SYSTEM

Hidehito Aoyagi, and Botaro Hirosaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 24, 1984, Ser. No. 643,857
Claims priority, application Japan, Aug. 26, 1983, 58-156099
Int. Cl.[4] H04L 1/06; H04B 7/08, 3/04
U.S. Cl. 375—40 18 Claims



1. A selective fading protection system for protecting against fading selectively occurring in a specific channel of a parallel data transmission system, said system comprising:

a plurality of data channels;

an equalizer provided in each channel and adapted for equalizing received data;

an error correcting means for correcting errors of said received data in at least any one channel;

a comparator associated with each channel and adapted to deliver a first signal when the level of said received data in the associated channel has been reduced below a predetermined first threshold level to indicate a level reduced channel; and

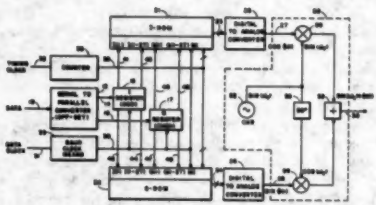
a controller adapted to operate in response to said first signal so as to deliver, as reference data, the correct data, after correction by said error correcting means, to the equalizer provided in the level reduced channel, and to effect a supervised-learning operation for correcting a coefficient of said equalizer in the level reduced channel so as to reduce the difference between said reference data and the output from said equalizer in said level reduced channel.

4,613,976

CONSTANT ENVELOPE OFFSET QPSK MODULATOR

Ake Sewerinson, Port Coquitlam, and Andrew V. Hellquist, Burnaby, both of Canada, assignors to British Columbia Telephone Company, Burnaby, Canada

Filed May 2, 1984, Ser. No. 606,427
Int. Cl.[4] H04L 27/18
U.S. Cl. 375—82 9 Claims



9. In a method of generating a constant envelope offset phase shift keyed modulated signal vector from a digital input data signal in which alternate bits are directed into in-phase I and quadrature-phase Q channels, with the current bit that is entered into each channel being held constant for a time interval 2T of the current and next data bits, and wherein the phase of the signal vector is varied by prescribed amounts and in prescribed directions during a symbol interval T of each data bit in response to signals produced in the I and Q channels, the improvement comprising the step of causing the rate of change w of phase to be determined as follows:

I(t) = I(t − 2T)	Q(t) = Q(t − 2T)	|w|
yes	yes	O
yes	no	W
no	yes	W
no	no	2W

where I(t) and Q(t) represent the current data bits in the in-phase and quadrature-phase channels, respectively; I(t−2T) and Q(t−2T) represent the immediate past data bits in the in-phase and quadrature-phase channels, respectively; I(t-)=I(t−2T) and Q(t)=Q(t−2T) are identities; w is the phase velocity or rate of change of phase; and W and 2W are constant phase velocities that will rotate the signal vector a total of 45° and 90°, respectively, in one bit time T.

4,613,977
DIGITAL NAVSTAR RECEIVER

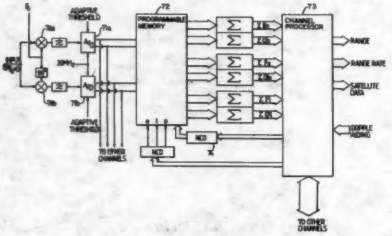
Andrew C. C. Wong, Harlow; Graham R. Fearnhead, Writtle Chelmsford, and Simon J. Gale, Bishops Stortford, all of United Kingdom, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Nov. 29, 1984, Ser. No. 676,420

Claims priority, application United Kingdom, Jan. 19, 1984, 8401431

Int. Cl.[4] H04B *1/30*; H04L *7/04*

U.S. Cl. 375—97 **5 Claims**



1. A receiver for a Navstar satellite navigation system, said receiver comprising:

elements for amplification and down conversion to zero i.f. frequencies to produce quadrature signals representing a baseband signal phasor;

analogue-to-digital converters to digitise separately the quadrature signals;

means for locally generating digital codes;

means for correlating the digitised quadrature signals separately with the locally generated digital codes;

code and carrier tracking loops, and channel signal processing means for generating control signals for controlling the code and carrier tracking loops, the outputs of the correlation means being applied to the processing means;

correction means responsive to the control signals for effecting phase rotation of the baseband signal phasor to effect Doppler tracking in the carrier tracking loop;

said correlation means including a digital memory loaded with data in the form of "look-up" tables incorporating combinations of signal input conditions;

means for applying the digitised quadrature signals as partial address signals for the memory; and

said correlation means including means for generating additional address signals for the memory in response to the control signals;

whereby phase rotation correction is effected by accessing the memory in accordance with the address signals to produce an output signal for the channel signal processing means.

4,613,978
NARROWBAND INTERFERENCE SUPPRESSION SYSTEM

Richard R. Kurth, Sudbury, and Robert A. Gabel, Acton, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,766

Int. Cl.[4] H03K *11/00*

U.S. Cl. 375—99 **18 Claims**

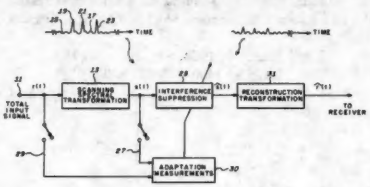
1. A narrowband interference suppression system for use with a broadband radio receiver comprising:

means for converting received time-domain signals to frequency-drain representations thereof:

means for suppressing pulses in the frequency domain representations having magnitudes that exceed a threshold level thereby providing suppressed frequency-domain signals;

means for determining a running average of received time domain signal amplitudes and for continuously adjusting the threshold level in accordance therewith;

reconstruction transformation means for reconverting the



suppressed frequency domain signals to coherent continuous time-domain output signals; and

means for applying the time-domain output signals to an external receiver.

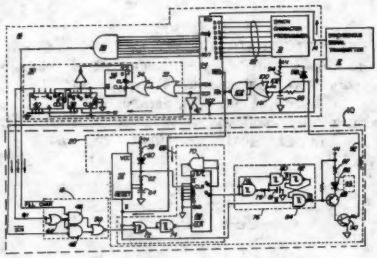
4,613,979
CONTINUOUS, AUTOMATIC RESET OF SYNCHRONOUS DATA RECEIVER UPON DETECTION OF LOSS OF SYNC

Dallas L. Kent, Evanston, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 3, 1984, Ser. No. 606,443

Int. Cl.[4] H04L *7/10*

U.S. Cl. 375—108 **9 Claims**



1. In a synchronous serial data communications system wherein a data record is provided to a receiver over a predetermined time interval, said data record preceded by a first timing signal and including a plurality of data words having a second timing signal associated therewith, wherein a second timing signal is provided in the absence of a data word, a system for synchronizing said receiver with said serial data comprising:

first timing means coupled to said receiver and responsive to said first timing signal for generating a third timing signal during each data word;

detector means coupled to said receiver and responsive to said first and second timing signals and further coupled to said first timing means and responsive to said third timing signal for providing a disable signal when said first or second timing signal occurs during said third timing signal;

reset means coupled to said receiver for providing a continuous reset signal to said receiver in initiating the synchronization of said receiver with the received serial data, said reset means further coupled to said detector means and responsive to said disable signal for terminating said reset signal when said first or second timing signal occurs during said third timing signals; and

second timing means coupled to said detector means and responsive to said disable signal for generating a fourth timing signal greater in duration than said predetermined

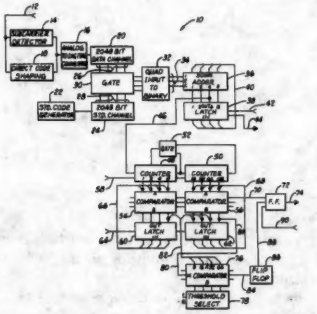
time interval and for providing said fourth timing signal to said reset means for continuing said disable signal in preventing the resetting of said receiver during receipt of a data record.

4,613,980

SYSTEM FOR HIGH ACCURACY REMOTE DECODING

Larry L. Newlin, and William L. Chapman, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 4, 1984, Ser. No. 646,792
Int. Cl.[4] H04L 7/04
U.S. Cl. 375—116 12 Claims



1. A method for reliably producing accurate start signals at remotely disposed locations, comprising the steps of:

selecting a time zero delay and initiating transmission from a first location of a selected data code of known duration less than said delay;

producing a first start signal at said first location upon expiration of said time zero delay;

receiving said selected data code at a second location and storing serial code bits for said duration;

comparing said selected data code with a standard code stored as serial code bits by comparing successive bits for each of plural groups of bits simultaneously to derive a serial code match count;

detecting first decrease in code match count indicative of complete code reception for the known duration; and

producing a second start signal at said second location upon decrease of code match count that is in general coincidence with said first start signal.

4,613,981

METHOD AND APPARATUS FOR LITHOGRAPHIC ROTATE AND REPEAT PROCESSING

Graham J. Siddall, Woodside; Steven G. Eaton, Palo Alto; James B. Kruger, Half Moon Bay; Garrett A. Garrettson, Los Altos Hills, and Armand P. Neukermans, Palo Alto, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 24, 1984, Ser. No. 573,524
Int. Cl.[4] G21K 5/00
U.S. Cl. 378—34 18 Claims

1. An apparatus for lithographically exposing a surface, the apparatus comprising:

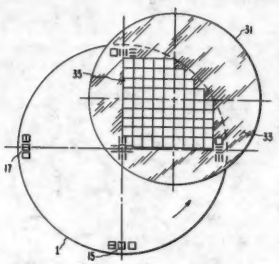
source means for emitting radiation;

a mask, located between the source means and the surface, the mask being divided into a plurality of radial sectors with each radial sector having a desired pattern thereon;

support means for supporting the surface;

a diaphragm, located between the mask and the source means, the diaphragm comprising a non-transmissive portion and a transmissive portion, the transmissive portion being substantially identical to, and aligned with, a radial sector of the mask; and

rotation means, attached to the diaphragm, for rotating the diaphragm so that the transmissive portion is aligned with a desired radial section of the surface,



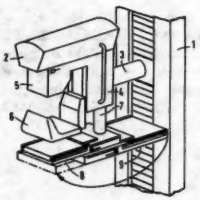
wherein the surface is divided into a plurality of radial sectors.

4,613,982

RADIODIAGNOSTIC APPARATUS FOR MAMMOGRAMS

Hans-Peter Dornheim, Bubenreuth, and Edmund Saffer, Eggolsheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,527
Claims priority, application Fed. Rep. of Germany, May 30, 1983, 3319622
Int. Cl.[4] A61B 6/04; G03B 42/02
U.S. Cl. 378—37 4 Claims



1. In a mammographic radiodiagnostic apparatus of the type having an x-ray source attached to a mount, a compression device and a plurality of recording stages which are selectively alignable with the x-ray source and are each constructed to receive an individual film cassette, the improvement wherein said plurality of recording stages are pivotally connected to the mount in such a manner that any one of said plurality is alignable with the x-ray source to expose its film cassette, and all others in said plurality are thereupon disaligned with the x-ray source in a non-exposable position.

4,613,983

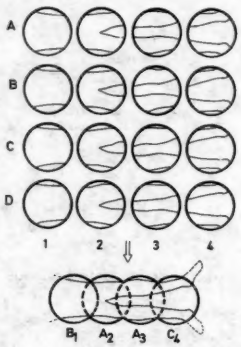
METHOD FOR PROCESSING X-RAY IMAGES

Henri Yedid, Issy les Moulineaux, and Maurice Audoin, Bretigny sur Orge, both of France, assignors to Thomson CSF, Paris, France

Filed Apr. 19, 1985, Ser. No. 725,352
Claims priority, application France, May 25, 1984, 84 08253
Int. Cl.[4] H05G 1/64
U.S. Cl. 378—99 5 Claims

1. A method for processing X-ray images obtained in respect of different relative positions between a source-receiver assembly and a support for a body to be radiographed along a predetermined path, of the type which comprises storing each image

in memory in the form of digital data which are representative of pixels of said images, wherein said method comprises the steps of obtaining overlapping images, in locating and storing said corresponding relative positions, in reading parts of the



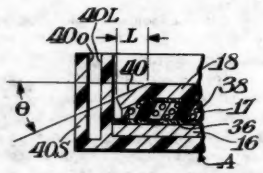
digital data of certain images, said parts being a function of said relative positions, and in converting the digital data of said parts to video signals for displaying a composite image formed by the joining-together of at least certain predetermined X-ray images aforesaid.

4,613,984

QUICK FILM RELEASE X-RAY CASSETTE MECHANISM

Ronald T. Fisher, Middletown; Paul J. Fisher, Newark, and David P. Spain, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 7, 1984, Ser. No. 668,880
Int. Cl.[4] G03B *17/26*
U.S. Cl. 378—185 **12 Claims**



1. An x-ray cassette of the type having fixed and moveable plates adapted to receive a film sheet therebetween, a resilient pad having one side secured to the fixed plate, an x-ray intensifying screen secured to the other side of the pad, and a buckler member positioned in the cassette for engaging an edge of the film sheet to buckle the same, the cassette being adapted to release the film sheet from the cassette in a direction parallel to the buckler engaging edge, characterized in that

the resilient pad has substantially the entire surface of the one side secured to the plate, and

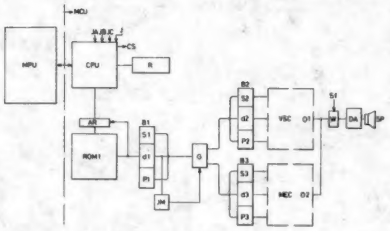
the screen has a portion of an edge contiguous a buckler bent in the direction of the fixed plate, thereby to facilitate release of the film sheet when the plates are separated and the bucklers are activated.

4,613,985

SPEECH SYNTHESIZER WITH FUNCTION OF DEVELOPING MELODIES

Shintaro Hashimoto, Ikoma, and Hideo Yoshida, Kashihara, both of, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1980, Ser. No. 218,753
Claims priority, application Japan, Dec. 28, 1979, 54-171550
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—51 **6 Claims**



1. A synthesizer comprising:

central processor means for receiving word codes or melody program codes and for outputting signals controlling said synthesizer;

memory means for storing data representing sequences of sound synthesis for each of a plurality of words and melodies which may be synthesized by said synthesizer;

word generator means for providing audible indications of words in the form of synthesized sounds; and

melody generator means for providing audible indications of melodies in the form of synthesized sounds,

means responsive to said central processor means for fetching first data representing the sequence of sound synthesis of at least one word from said memory means and for providing said first data to said word generator means; and

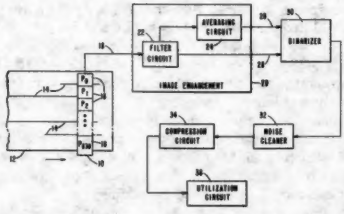
means responsive to said central processor means for fetching second data representing the sequence of sound synthesis of at least one melody from said memory means and for providing said second data to said melody generator means.

4,613,986

DIGITAL FILTER FOR ENHANCEMENT OF DOCUMENT IMAGES

Ergin Ataman, Istanbul, Turkey, and J. Thomas King, Waterloo, Canada, assignors to NCR Canada Ltd., Mississauga, Canada

Filed Jun. 14, 1984, Ser. No. 620,660
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—54 **3 Claims**



1. In an apparatus for scanning a document image by sequentially presenting a gray level value of a plurality of elements arranged in a matrix having m rows and n columns, a device for enhancing the document image comprising;

sensor means having an array of sensor devices for scanning a column of the gray level values of the elements of the matrix, each sensor device for sensing a gray level value of a row element in a column being scanned;

reading means having an input connected to said sensor devices and an output, said reading means for sequentially reading said sensor devices and sequentially placing the gray level value of each sensor device on its output;

a plurality of memory devices each having an input-output means for receiving data to be read into each memory device and for providing data to be written out of each memory device, each of said memory devices for storing a column of m rows of gray level values from said sensor means;

an input register for storing gray level values therein, said input register having an input connected to the output of said reading means for receiving therefrom the gray level values, and an output for providing thereon the stored gray level values;

a plurality of element storage registers equal in number to the number of memory devices, each element storage register having an input connected to the input-output means of a corresponding memory device for receiving and storing data therefrom, and an output for providing thereon the data stored in said each element storage register;

a plurality of tri-state means equal in number to the number of memory devices, each of said tri-state means having an input for receiving data, an output for providing data, and a control terminal which, when enabled, places on its output data which is present on its input, the first of said tri-state means having its input connected to the output of said input register and its output connected to the input-output means of the first of said memory devices, and each of the remainder of said tri-state means successively having its input connected to a succeeding one of said element storage registers and its output connected to the input-output means of a succeeding one of said memory devices; and

addressing means connected to the input-output means of said memory devices and the control terminals of said tri-state means for controlling the inputting of gray level values into and the outputting of gray level values out of said memory devices, said addressing means including first means for controlling the simultaneous storing of a gray level value from said reading means into said input register and a storing of data from a corresponding row of data entries in said memory devices into said element storage registers, and second means for enabling said tri-state means for writing data entries stored in said input data register and said element data registers into a corresponding one of said memory devices such that the data entries written from said element storage registers are shifted one column from their previous storage locations, such that the reading of the gray level value of each sensor device shifts a window of data in the matrix by one column and one row.

4,613,987

IMAGE SCANNING ARRANGEMENT

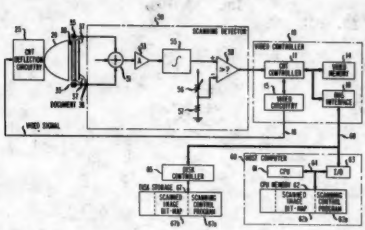
Kenneth M. Keverian, Westfield, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Feb. 15, 1985, Ser. No. 702,255
Int. Cl.[4] G06K *7/10*
U.S. Cl. 382—65 **9 Claims**

1. A scanning arrangement for use in conjunction with a display device having a plurality of individually energizable light-emissive pixel locations, said arrangement comprising

light-transmissive means adapted to be adjacent to said display device and having first and second spaced-apart, generally parallel surfaces, said light-transmissive means being adapted to entrap between said surfaces by internal reflection light originating from energized ones of said pixel locations at least when a surface of an object is placed on said second surface, the amount of light that is entrapped being a function of the reflectivity characteristics of said surface of said object,

detection means for generating a light detection signal indicative of the level of said entrapped light,



means for causing said device to successively energize at least ones of said pixel locations, and

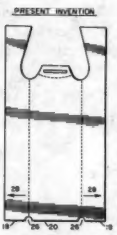
means for storing for each of said energized pixel locations a pixel signal which is a function of the level of said light detection signal during the time that said each of said pixel locations was energized.

4,613,988

THERMOPLASTIC BAG AND METHOD OF FORMING THE SAME

Robert T. Maddock, W. Rush, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,836
Int. Cl.[4] B65D *33/10*
U.S. Cl. 383—8 **3 Claims**



1. In a plastic film sack having gusseted side walls and a heat-seal bottom stripe welding together four film layers in the outer region of the bag bottom and two film layers in the center region of the bag bottom, the improvement comprising:

the provision of two stress relief structures in the bottom of said sack, said structures having the following characteristics:

(a) they at least correspond to the shape remaining in said sack from two cut-away regions located as spaced interruptions in and extending a short distance above the line of the heat-sealed bottom stripe;

(b) they are located so as to prevent the formation of or eliminate any preformed heat seal juncture at each gusset at its point of maximum in-folding and the bottom of the sack; and

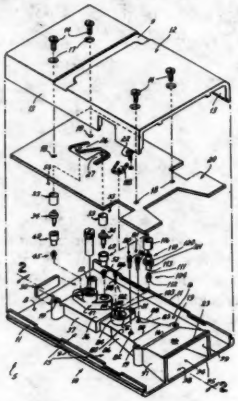
(c) said shape is at least generally arcuate so as to constitute stress relief arcs extending from a four film seal point to a two film seal point in said heat sealed bottom stripe.

4,613,989

POLICE RADAR WARNING RECEIVER

John R. Fende; Gregory R. Furnish, both of Mason, and Richard L. Grimsley, Cincinnati, all of Ohio, assignors to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Sep. 28, 1984, Ser. No. 656,026
Int. Cl.[4] H04B 1/08
U.S. Cl. 455—351 102 Claims



1. A microwave apparatus, comprising:

an electrically conductive structure dimensioned and shaped to receive microwave signals, said structure having a bottom wall, a rearwardly positioned microwave oscillator section, a forwardly positioned microwave horn section, and a microwave section disposed therebetween, each said section having a top wall confronting a portion of said bottom wall and having confronting left and right walls to define respective microwave oscillator, horn and mixer cavities, each said wall having an inner, cavity-facing surface and an outer surface;

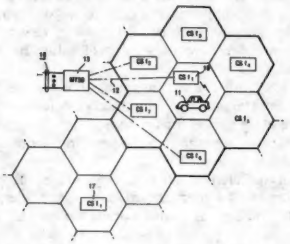
at least a portion of said bottom wall outer surface defining a portion of one side of a multi-sided housing adpated to enclose said top, left and right walls of said cavities.

4,613,990

RADIOTELEPHONE TRANSMISSION POWER CONTROL

Samuel W. Halpern, Matawan, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1984, Ser. No. 624,455
Int. Cl.[4] H04B 7/00
U.S. Cl. 455—33 11 Claims



11. A method for dynamically adjusting operating power levels in a cellular mobile radiotelephone system including at least a first movable station and a second fixed station, each station having a transmitter and a receiver for a predetermined radio channel, at least said fixed station including means for interrupting a subscriber communication on said channel for transmitting a burst of data signal, said method comprising the steps of

measuring, in said fixed station, levels of signals received from said movable station,

adjusting output power of said transmitter of said fixed station, in response to results of said measuring step, to be at a level which will be received within a predetermined level range at said movable station,

determining in said fixed station an appropriate power level of transmission for said movable station to bring said received signal levels at said fixed station into a predetermined range at said fixed station and which is independent of said movable station range, and

directing, by a data signal burst, said movable station to adjust its transmitter power to said appropriate power level in a single step.

DESIGN PATENTS

GRANTED SEP. 23, 1986

ERRATA

For CLASS	See PATENT NO.
D02–185	285,185
D03–101	285,822
D06–575	285,856

285,740

SEAWEED PLATE GARNISH FOR A SUSHI OR SASHIMI DISH AND THE LIKE

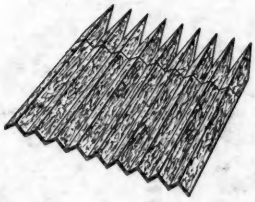
Chokichi Watanabe, 75, Aza Hieda, Ohaza-Tawara, Tawara-cho, Atsumi-gun, Aichi-ken, Japan

Filed Jun. 23, 1983, Ser. No. 506,995

Claims priority, application Japan, Apr. 19, 1983, 58-16346

Term of patent 14 years

U.S. Cl. D1—122



285,741

COMBINED HELMET AND MASK

Adrien Gallet, Chatillon Sur Chalaronne, France, assignor to Jean Gallet et Fils S.A., Chatillon sur Chalaronne, France

Filed Apr. 10, 1984, Ser. No. 598,749

Claims priority, application France, Oct. 10, 1983, 833 678

Term of patent 14 years

U.S. Cl. D2—232

285,742

GLOVE

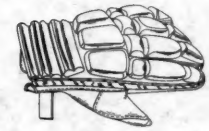
Juha Tirinen, Helsinki, Finland, assignor to Yoko-Team Oy, Finland

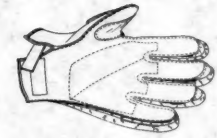
Filed May 31, 1983, Ser. No. 499,324

Claims priority, application Finland, Jan. 28, 1983, 91/83

Term of patent 14 years

U.S. Cl. D2—361





285,743

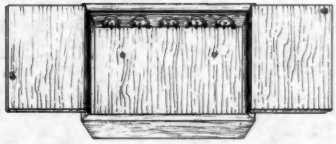
CAROUSEL JEWELRY BOX

Judith A. Richwine, 4041 Gill Ave., Hampstead, Md. 21074

Filed Oct. 18, 1983, Ser. No. 543,164

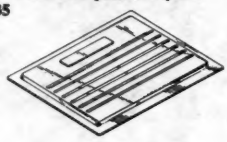
Term of patent 14 years

U.S. Cl. D3—30.1

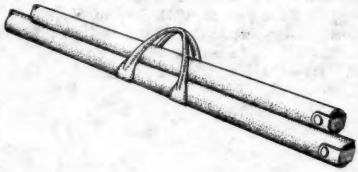


285,744
CONTACT LENS CASE
Jean-Pierre R. P. Vinot, 42 Rue Mere Maria Pia, Quincy S/S Senart, France 91480
Filed Feb. 13, 1984, Ser. No. 579,788
Term of patent 14 years
U.S. Cl. D3—34

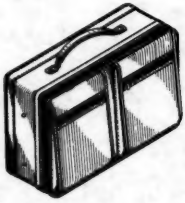
285,745
COMPUTER DISK STAND
Ronald A. Friedman, Corning, N.Y., assignor to Frank Gaydorus, Syracuse, N.Y.
Filed Jan. 23, 1984, Ser. No. 573,195
Term of patent 14 years
U.S. Cl. D3—35



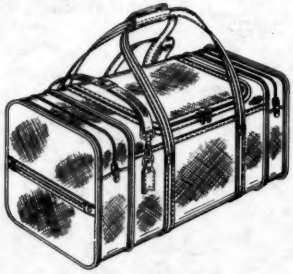
285,746
CARRYING CASE FOR A WEIGHTED EXERCISE BAR OR THE LIKE
William J. Oates, 101 E. C Ave., Easley, S.C. 29640
Filed Aug. 18, 1983, Ser. No. 524,427
Term of patent 14 years
U.S. Cl. D3—36



285,747
LUGGAGE CASE
Michael Davis, and William H. Wilhoit, both of New Castle, Pa., assignors to Airway Industries, Inc., Ellwood City, Pa.
Filed Mar. 29, 1984, Ser. No. 594,985
Term of patent 14 years
U.S. Cl. D3—48

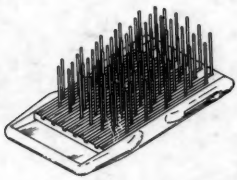


285,748
LUGGAGE CASE
Martin R. Feinberg, New York, NY, and Eckhard Knoepke, Norwalk, Conn., assignors to Samsonite Corporation, Denver, Colo.
Filed Mar. 19, 1984, Ser. No. 591,141
Term of patent 14 years
U.S. Cl. D3—48

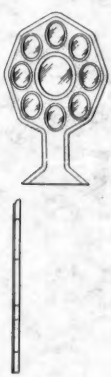


285,749
PAINTING IMPLEMENT HANDLE
James F. Mariol, Cincinnati, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed May 1, 1984, Ser. No. 605,783
Term of patent 14 years
U.S. Cl. D4—115

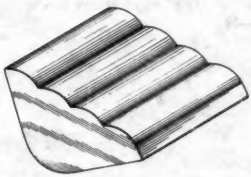
285,750
FOLDING HAIRBRUSH
John E. Bills, 667 Osceola Ave., Winter Park, Fla. 32789
Filed Jan. 9, 1984, Ser. No. 569,564
Term of patent 14 years
U.S. Cl. D4—136



285,751
FAMILY TREE PICTURE HOLDER
Drago Timarac, 11205 Irene Dr., Warren, Mich. 48093
Filed Jan. 9, 1984, Ser. No. 569,222
Term of patent 14 years
U.S. Cl. D6—301



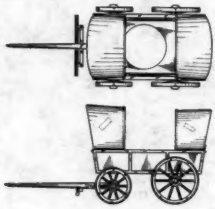
285,752
INFLATABLE ROCKING FOOTREST
Brian D. Sadow, 21 Pondhill Rd., Chappaqua, N.Y. 10514
Filed Apr. 11, 1984, Ser. No. 599,284
Term of patent 14 years
U.S. Cl. D6—349

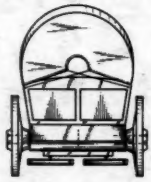


285,753
CHAIR
Colman Zola, 50 Tamarack Way, Pleasantville, N.Y. 10570
Filed Nov. 22, 1983, Ser. No. 554,618
Term of patent 14 years
U.S. Cl. D6—373

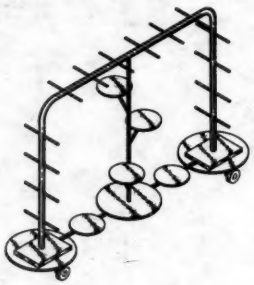
285,754
PLANT SUPPORT OR THE LIKE
W. Roger Beaty, 1013 Mabel Fry Blvd., Yukon, Okla. 73099
Filed Mar. 15, 1984, Ser. No. 590,002
Term of patent 14 years
U.S. Cl. D6—403

285,755
SUPPORT FOR FLOWER POTS
Gerardus F. Mens, Von Bonninghausenlaan 4, 2161 Et Lisse, Netherlands
Filed Feb. 7, 1985, Ser. No. 699,251
Claims priority, application Hague, Aug. 20, 1984, DM00410G
Term of patent 14 years
U.S. Cl. D6—404

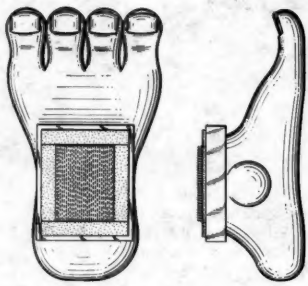




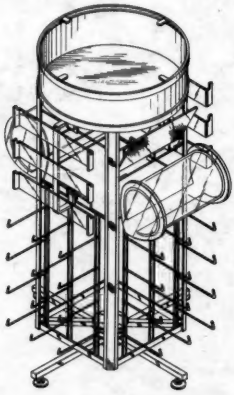
285,756
PLANT RACK
Irene Harper, 8200 Anchor Dr., Woodridge, Ill. 60517
Filed Oct. 26, 1984, Ser. No. 665,148
Term of patent 14 years
U.S. Cl. D6—405



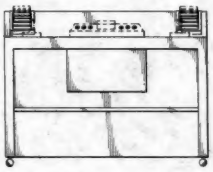
285,757
PORTABLE ELECTRONIC EQUIPMENT STAND
David R. Lewis, 365 Stevens Ave., Ridgewood, N.J. 07450
Filed Jun. 28, 1984, Ser. No. 625,633
Term of patent 14 years
U.S. Cl. D6—450



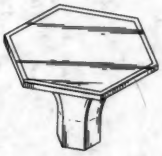
285,758
MERCHANDISE DISPLAY STAND
David March, New York, N.Y., assignor to Thomson Leeds Company Inc., New York, N.Y.
Filed May 3, 1984, Ser. No. 606,528
Term of patent 14 years
U.S. Cl. D6—465



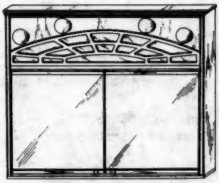
285,759
VIDEO GAME CABINET
Viloes G. Wright, 505 Cypress Station Dr., #107, Houston, Tex. 77090
Filed Jul. 22, 1983, Ser. No. 516,041
Term of patent 14 years
U.S. Cl. D6—467



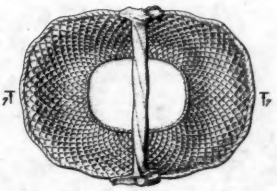
285,760
TABLE
Cynthia Milling, 225 Central Park West Apt. 1117, New York, N.Y. 10024
Filed Mar. 8, 1984, Ser. No. 587,473
Term of patent 14 years
U.S. Cl. D6—486

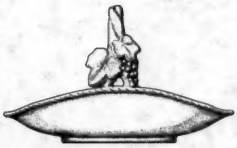


285,761
WALL MOUNTED CABINET
James J. Palka, Kildeer, Ill., assignor to Pace Industries Inc., Chicago, Ill.
Filed Aug. 30, 1984, Ser. No. 645,568
Term of patent 14 years
U.S. Cl. D6—561



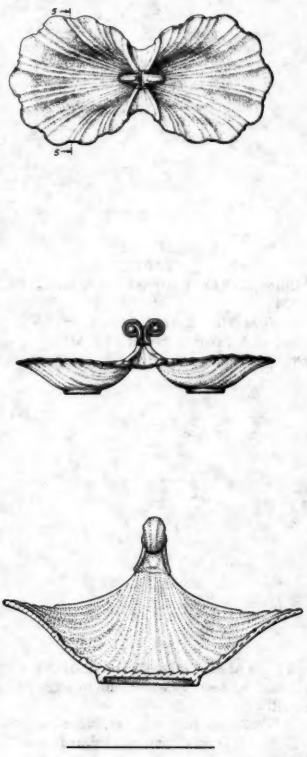
285,762
SNACK BASKET
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jun. 4, 1984, Ser. No. 616,933
Term of patent 14 years
U.S. Cl. D7—5



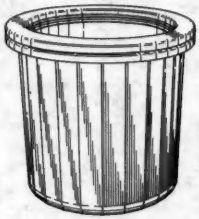


285,763
TRIPLE SERVER TRAY
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 4, 1984, Ser. No. 616,922
Term of patent 14 years
U.S. Cl. D7—19

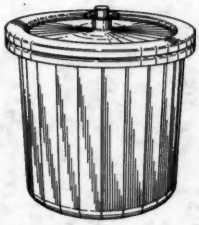
285,764
DOUBLE SERVER TRAY
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 4, 1984, Ser. No. 616,934
Term of patent 14 years
U.S. Cl. D7—19



285,765
ICE BUCKET OR THE LIKE
Mark P. Zieff, Lexington, Mass., assignor to Dart Industries Inc, Northbrook, Ill.
Filed Oct. 20, 1983, Ser. No. 543,743
Term of patent 14 years
U.S. Cl. D7—78

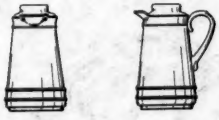


285,766
ICE BUCKET WITH CLOSURE OR THE LIKE
Mark P. Zieff, Lexington, Mass., assignor to Dart Industries, Northbrook, Ill.
Filed Oct. 20, 1983, Ser. No. 543,744
Term of patent 14 years
U.S. Cl. D7—78



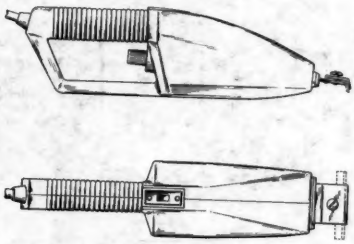
285,767
ICE BUCKET OR THE LIKE
Mark P. Zieff, Lexington, Mass., assignor to Dart Industries, Northbrook, Ill.
Filed Oct. 21, 1983, Ser. No. 544,316
Term of patent 14 years
U.S. Cl. D7—78

285,768
INSULATED PITCHER OR THE LIKE
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Jan. 4, 1984, Ser. No. 568,218
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, MR201
Term of patent 14 years
U.S. Cl. D7—317

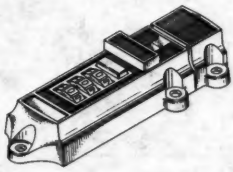


285,769
TIRE REPAIR TOOL
Robert Flory, Weber Falls, and Norman Bridge, Muskogee, both of Okla., assignors to Bridge Products, Inc., Northbrook, Ill.
Filed Feb. 28, 1983, Ser. No. 468,540
Term of patent 14 years
U.S. Cl. D8—31

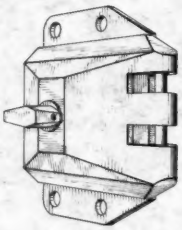
285,770
POWER UNIT FOR A PAINT SCRAPER OR SIMILAR ARTICLE
Douglas W. Smith, Belle Mead, and Mark N. Bonner, Princeton, both of N.J., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.
Filed Aug. 15, 1983, Ser. No. 522,968
Term of patent 14 years
U.S. Cl. D8—69



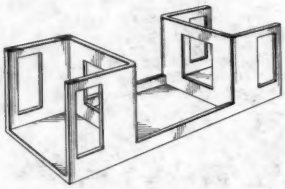
285,771
DEAD BOLT COMBINATION LOCK
Charles S. Gehrie, West Orange, and Lester G. Kloin, Matawan, both of N.J., assignors to Presto Lock, Inc., Garfield, N.J.
Filed Feb. 6, 1984, Ser. No. 577,025
Term of patent 14 years
U.S. Cl. D8—331



285,772
DEAD-BOLT LOCK
Ronald N. Oliver, Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.
Filed May 11, 1984, Ser. No. 609,239
Term of patent 14 years
U.S. Cl. D8—341



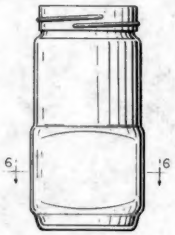
285,773
INTERLOCKING SHELF BRACKET FOR A FIREWOOD RACK OR SIMILAR ARTICLE
Walter H. Cappel, 1523 20th Ave. N., Texas City, Tex. 77590, and Gerald W. Hartenberger, 3010 Layne, LaPorte, Tex. 77571
Filed Mar. 21, 1984, Ser. No. 591,920
Term of patent 14 years
U.S. Cl. D8—380



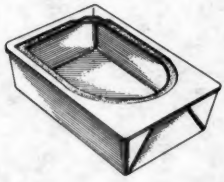
285,774
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Dec. 3, 1984, Ser. No. 677,459
Term of patent 14 years
U.S. Cl. D9—389

285,775
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Dec. 3, 1984, Ser. No. 677,659
Term of patent 14 years
U.S. Cl. D9—389

285,776
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Sep. 1, 1983, Ser. No. 528,674
Term of patent 14 years
U.S. Cl. D9—401



285,777
PACKAGING TRAY FOR FOOD OR THE LIKE
Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Feb. 22, 1984, Ser. No. 582,615
Term of patent 14 years
U.S. Cl. D9—416

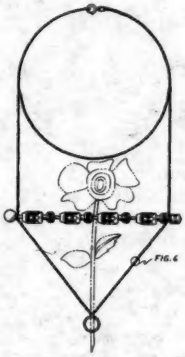


285,778
PAINT CAN DRIP GUARD
Christian E. Smith, 12434 W. Florida Dr., Denver, Colo. 80228
Filed Jul. 25, 1983, Ser. No. 516,524
Term of patent 14 years
U.S. Cl. D9—434

285,779
WRIST WATCH
Jeffrey Maron, 248 Lafayette St., New York, N.Y. 10012
Filed Mar. 2, 1984, Ser. No. 585,509
Term of patent 14 years
U.S. Cl. D10—30

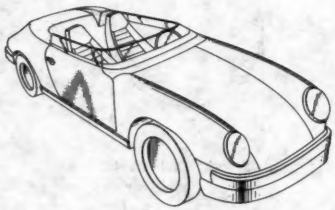
285,780
LEVEL RULE
Donald Wright, 14265 Juneau Blvd., Elm Grove, Wis. 53202, and Randall J. Wright, 3535 Studio Ct., Brookfield, Wis. 53005
Filed Jan. 30, 1984, Ser. No. 574,917
Term of patent 14 years
U.S. Cl. D10—62

285,781
NECKLACE
Rogers J. Carter, 165 Massachusetts, Highland Park, Mich. 48203
Filed Feb. 3, 1984, Ser. No. 582,129
Term of patent 14 years
U.S. Cl. D11—6

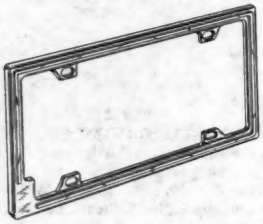


285,782
TABLE ORNAMENT
Jean W. Heap, Pwllheli, Wales, assignor to Pendelfin Studios Limited, Lancashire, England
Filed Oct. 29, 1984, Ser. No. 665,992
Claims priority, application United Kingdom, May 5, 1984, 1019513
Term of patent 14 years
U.S. Cl. D11—157

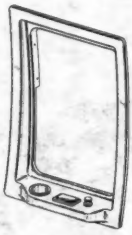
285,783
OPEN SPORT CAR
Wolfgang Möebius, Stuttgart, and Peter Reisinger, Ditzingen, both of Fed. Rep. of Germany, assignors to Porsche AG, Fed. Rep. of Germany
Filed May 23, 1983, Ser. No. 497,273
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, MR 5559
Term of patent 14 years
U.S. Cl. D12—92



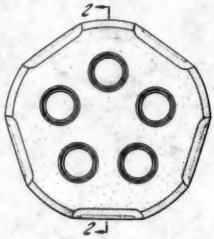
285,784
LICENSE PLATE HOLDER
Eric Langensiepen, New York, N.Y., assignor to Allison Corporation, Livingston, N.J.
Filed Mar. 15, 1984, Ser. No. 590,025
Term of patent 14 years
U.S. Cl. D12—193



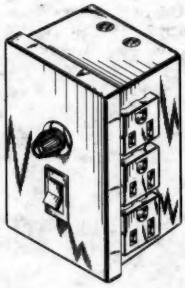
285,785
WINDOW SHROUD FOR RECREATIONAL VEHICLES AND VAN CONVERSIONS
John R. Westall, 205 N. Merchant, Oswego, Kans. 67356
Filed Dec. 27, 1983, Ser. No. 565,420
Term of patent 14 years
U.S. Cl. D12—183



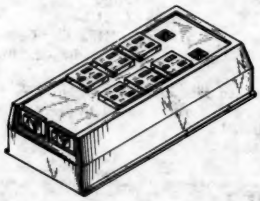
285,786
VEHICLE WHEEL COVER
Robert J. Munson, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 3, 1984, Ser. No. 637,484
Term of patent 14 years
U.S. Cl. D12—210



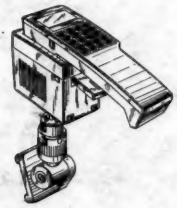
285,787
MULTIPLE OUTLET
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed May 10, 1984, Ser. No. 608,848
Term of patent 14 years
U.S. Cl. D13—30



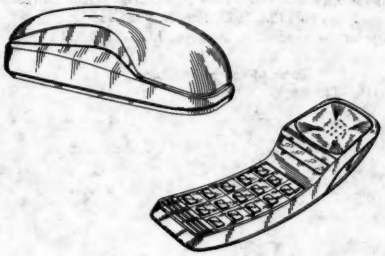
285,788
ELECTRICAL OUTLET
Harold B. Rapp, Williston Park, and Herbert Towne, Brookville, both of N.Y., assignors to North American Philips Corp., New York, N.Y.
Filed Oct. 3, 1984, Ser. No. 657,281
Term of patent 14 years
U.S. Cl. D13—30



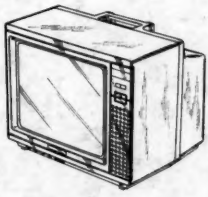
285,789
MOBILE TELEPHONE ASSEMBLY INCLUDING HANDSET, CRADLE AND MOUNTING
James Karlin, Fairport, N.Y., assignor to Walker Telecommunications Corporation, Hauppauge, N.Y.
Filed Apr. 30, 1984, Ser. No. 605,413
Term of patent 14 years
U.S. Cl. D14—53



285,790
COMBINED HANDSET AND BASE TELEPHONE SET
Michael A. Harrison, Newport Beach, and William R. Story, Mission Viejo, both of Calif., assignors to GTE Communication, Northlake, Ill.
Filed Apr. 9, 1984, Ser. No. 597,979
Term of patent 14 years
U.S. Cl. D14—53

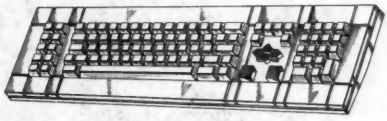


285,791
TELEVISION RECEIVER
Akemi Takahashi, Kokubunji; Takao Aoki, Hachiouzi; Toru Kiyota, Tachikawa, and Ryuuichirou Tanaka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 6, 1984, Ser. No. 577,499
Claims priority, application Japan, Aug. 29, 1983, 58-37339
Term of patent 14 years
U.S. Cl. D14—80

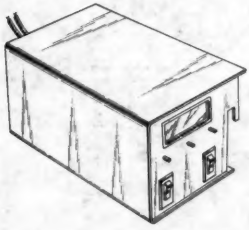


285,792
SATELLITE DISH ANTENNA SUPPORT RIB
John R. Winegard, Evergreen, and Keith B. Cowan, Arvada, both of Colo., assignors to Winegard Company, Burlington, Iowa
Filed Jan. 11, 1984, Ser. No. 569,831
Term of patent 14 years
U.S. Cl. D14—90

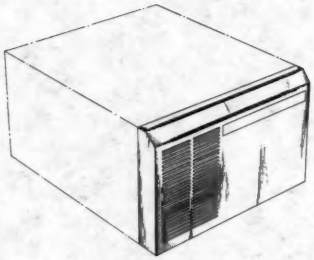
285,793
KEYBOARD HOUSING ASSEMBLY
William G. Moggridge, Palo Alto, Calif., assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jul. 5, 1984, Ser. No. 627,842
Term of patent 14 years
U.S. Cl. D14—100



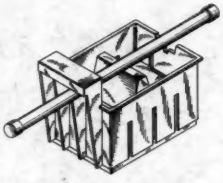
285,794
COMBINED HEAT REDUCTION FAN AND ELAPSED OPERATION TIME INDICATOR FOR COMPUTER
James A. Cladek, 3521 Rachael Ave., Simi Valley, Calif. 92063
Filed Aug. 1, 1983, Ser. No. 514,710
Term of patent 14 years
U.S. Cl. D14—114

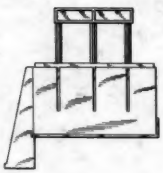


285,795
COMMUNICATION EQUIPMENT COVER
David L. Chandler, Holmdel, N.J., and Chris G. Johnson, New York, N.Y., assignors to AT&T Information Systems Inc., Holmdel, N.J.
Filed Oct. 1, 1985, Ser. No. 782,511
Term of patent 14 years
U.S. Cl. D14—115



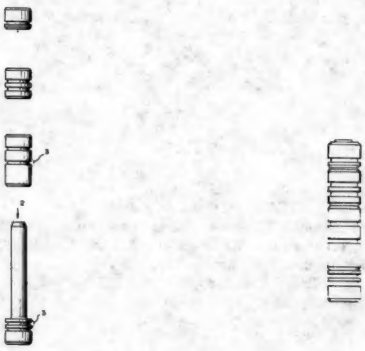
285,796
PAPER BRICKMAKING UNIT
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Feb. 11, 1983, Ser. No. 465,794
Term of patent 14 years
U.S. Cl. D15—123



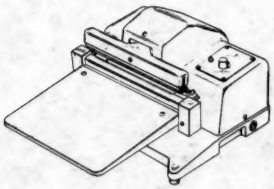


285,797
DRILL PRESS
Robert W. Arehart, Cook County, Ill., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jun. 28, 1984, Ser. No. 625,859
Term of patent 14 years
U.S. Cl. D15—132

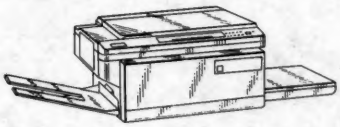
285,798
SET OF PILLARS AND BUSHES
Ake Brunnegard, Furuvägen 10; Erik W. Nilsson, Asbovägen 1, and Hans Ring, Furuvägen 14, all of, S-513 00 Fristad, Sweden
Filed Nov. 23, 1983, Ser. No. 554,796
Claims priority, application Austria, Jun. 9, 1983, 529.691 - 700
Term of patent 14 years
U.S. Cl. D15—143



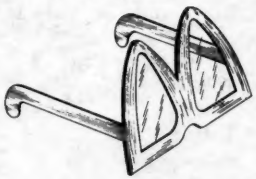
285,799
HEAT SEALING MACHINE
Teruo Yamada, Osaka, Japan, assignor to Fuji Mfg. Co. Ltd., Osaka, Japan
Filed Mar. 23, 1984, Ser. No. 592,998
Term of patent 14 years
U.S. Cl. D15—146



285,800
ELECTROPHOTOGRAPHIC COPIER
Toshihiko Kadota, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 18, 1984, Ser. No. 611,955
Claims priority, application Japan, Nov. 25, 1983, 58-51364
Term of patent 14 years
U.S. Cl. D16—31

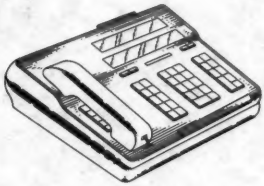


285,801
EYEGLASSES
John W. Looney, 228 Finley Dr., Decatur, Ala. 35602
Filed Aug. 26, 1983, Ser. No. 526,707
Term of patent 14 years
U.S. Cl. D16—102



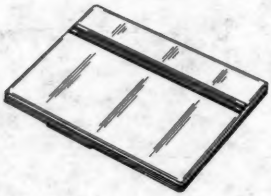
285,802
TERRESTRIAL TELESCOPE
Takeo Ogasawara, Tokyo, Japan, assignor to Kowa Company Ltd., Japan
Filed Apr. 4, 1984, Ser. No. 596,535
Term of patent 14 years
U.S. Cl. D16—132

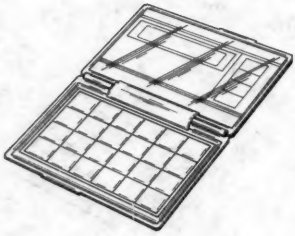
285,803
TELEPHONE-CALCULATOR CONSOLE
Angela Leone, 191 Hickory Hill, Williamsville, N.Y. 14221
Continuation-in-part of Ser. No. 287,272, Jul. 27, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 515,671
The portion of the term of this patent subsequent to Dec. 23, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—2



285,804
ELECTRONIC TYPEWRITER
Wayne C. Cathey, Bedford, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 4, 1984, Ser. No. 646,408
Term of patent 14 years
U.S. Cl. D18—2

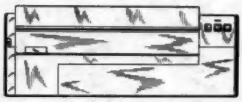
285,805
ELECTRONIC CALCULATOR
Takahisa Yubisui, and Hiroshi Sakaguchi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 29, 1984, Ser. No. 676,079
Claims priority, application Japan, Jun. 5, 1984, 59-23159
Term of patent 14 years
U.S. Cl. D18—7



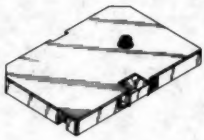


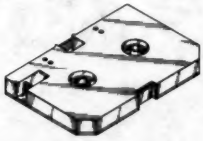
285,806
ELECTRONIC CALCULATOR
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 15, 1984, Ser. No. 620,900
Claims priority, application Japan, Dec. 20, 1983, 58-55286
Term of patent 14 years
U.S. Cl. D18—7

285,807
ELECTRONIC PRINTER
Hiroshi Otsuka, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed May 18, 1984, Ser. No. 613,690
Claims priority, application Japan, Nov. 24, 1983, 58-50967
Term of patent 14 years
U.S. Cl. D18—13

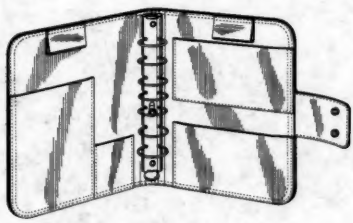


285,808
CARTRIDGE FOR INK RIBBON
Seiro Fuziwara, Shizuoka; Masao Kobori, and Norio Takida, both of Mishima, all of Japan, assignors to Tokyo Electric O., Ltd., Tokyo, Japan
Filed Aug. 3, 1984, Ser. No. 637,475
Claims priority, application Japan, Feb. 14, 1984, 59-4789
Term of patent 14 years
U.S. Cl. D18—22

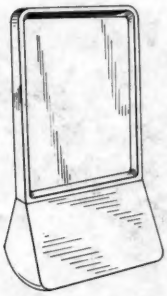




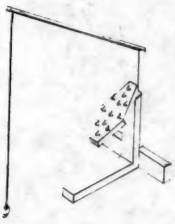
285,809
COMBINED ORGANIZER POUCH AND LOOSE LEAF BINDER
Philip S. Sindler, 1320 La Sobrina Ct., Solana Beach, Calif. 92075
Filed Mar. 5, 1984, Ser. No. 586,429
Term of patent 14 years
U.S. Cl. D19—27



285,810
DISPLAY
Kenneth A. Glasener, 1 Henneberry La., Golf, Ill. 60029
Filed Jul. 6, 1984, Ser. No. 628,490
Term of patent 14 years
U.S. Cl. D20—10

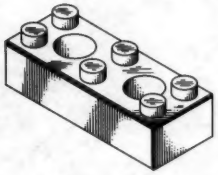


285,811
COMBINED TETHERED RING AND GAME TARGET
William E. Donahoe, 415 S. 17th St., Weirton, W. Va. 26062
Filed Apr. 11, 1983, Ser. No. 483,943
Term of patent 14 years
U.S. Cl. D21—62

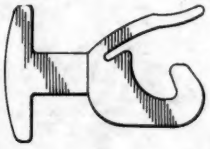


285,812
ILLUMINATED BOOMERANG
Alfred Green, Jr., R.R. 22100 Emery Rd., North Randall, Ohio 44128
Filed May 23, 1984, Ser. No. 612,973
Term of patent 14 years
U.S. Cl. D21—82

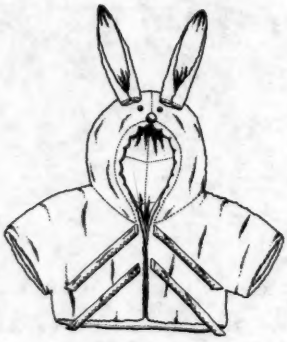
285,813
TOY INTERCONNECTING ADAPTOR BLOCK OR THE LIKE
Tokuo Takahashi, Tokyo, Japan, assignor to Kawada Co. Ltd., Tokyo, Japan
Filed Sep. 10, 1984, Ser. No. 648,528
Claims priority, application Japan, May 30, 1984, 59-21775
Term of patent 14 years
U.S. Cl. D21—108



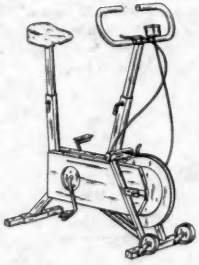
285,814
MODEL TRAIN COUPLER
Robert J. Byers, 420 Zang, #3-302, Lakewood, Colo. 80228
Continuation-in-part of Ser. No. 340,806, Jan. 19, 1982. This application Feb. 6, 1984, Ser. No. 577,175
Term of patent 14 years
U.S. Cl. D21—141



285,815
DOLL GARMENT
Anneli Finn, 104 Argilla Rd., Andover, Mass. 01810
Filed Feb. 23, 1984, Ser. No. 583,009
Term of patent 14 years
U.S. Cl. D2—185

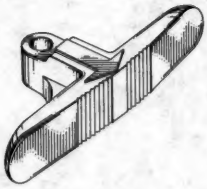


285,816
EXERCYCLE
Tommy Berntsson, Halmstad, Sweden, assignor to Monark AB, Varnberg, Sweden
Filed Nov. 2, 1984, Ser. No. 667,646
Term of patent 14 years
U.S. Cl. D21—194



285,817
GOLF PUTTER
William E. Richardson, Charlotte, N.C., assignor to Fryerich Putter Company, Charlotte, N.C.
Filed May 17, 1984, Ser. No. 611,173
Term of patent 14 years
U.S. Cl. D21—218

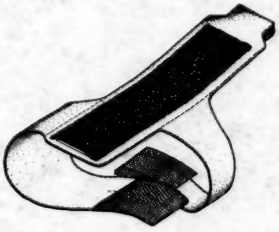
285,818
GOLF PUTTER HEAD
Lewis B. Moore, P.O. Box 17115, Fountain Hills, Ariz. 85268
Filed May 14, 1984, Ser. No. 609,754
Term of patent 14 years
U.S. Cl. D21—219



285,819
ICE SKATE
Rene Bourque, Duvernay, Canada, assignor to Warrington Inc., Montreal, Canada
Filed Jun. 4, 1984, Ser. No. 617,233
Claims priority, application Canada, Feb. 6, 1984, 06-02-84-7
Term of patent 14 years
U.S. Cl. D21—225

285,820
ICE SKATE
Rene Bourque, Duvernay, Canada, assignor to Warrington Inc., Montreal, Canada
Filed Jun. 4, 1984, Ser. No. 617,260
Claims priority, application Canada, Dec. 5, 1983, 05-12-83-10
Term of patent 14 years
U.S. Cl. D21—225

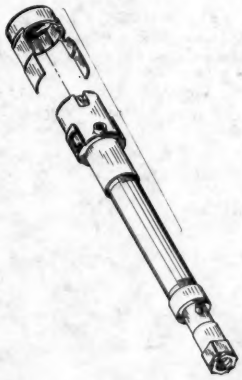
285,821
SPORTS WRIST BRACE
Rick A. Kneisley, 1310 Chestnut Ridge, Kingwood, Tex. 77339
Filed Aug. 8, 1983, Ser. No. 521,028
The portion of the term of this patent subsequent to Sep. 13, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—233



285,822
NOTCHED HOLSTER
Gordon W. Davis, c/o Davis Leather Co., 118 A La Porte St., Arcadia, Calif. 91006
Filed Jan. 3, 1984, Ser. No. 567,814
Term of patent 14 years
U.S. Cl. D3—101

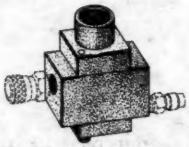
285,823
FISHING REEL BAIL ARM
Kanji Iinuma, and Yasuhisa Kameda, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Division of Ser. No. 486,769, Apr. 20, 1983. This application Feb. 25, 1985, Ser. No. 705,474
Claims priority, application Japan, Dec. 28, 1982, 57-58118
Term of patent 14 years
U.S. Cl. D22—140

285,824
COMBINED YARD HYDRANT AND HEAD WITH REMOVABLE CAP
Stephen J. Anderson, Storm Lake, Iowa, assignor to Merrill Manufacturing Company, Storm Lake, Iowa
Filed May 14, 1984, Ser. No. 609,707
Term of patent 14 years
U.S. Cl. D23—12

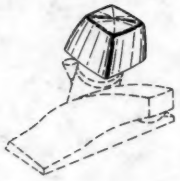


285,825
HEAD SECTION WITH REMOVABLE CAP FOR YARD HYDRANTS
Stephen J. Anderson, Storm Lake, Iowa, assignor to Merrill Manufacturing Company, Storm Lake, Iowa
Filed May 14, 1984, Ser. No. 609,709
Term of patent 14 years
U.S. Cl. D23—12

285,826
AIR ACTUATED GLUE VALVE
Edmund Neckel, Cincinnati, Ohio, assignor to Valco Cincinnati, Inc., Cincinnati, Ohio
Filed Dec. 5, 1983, Ser. No. 558,101
Term of patent 14 years
U.S. Cl. D23—19

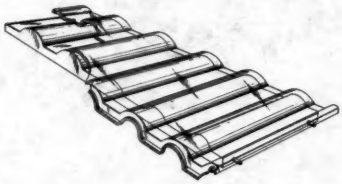


285,827
FAUCET HANDLE DESIGN
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Westfield, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Aug. 26, 1982, Ser. No. 411,866
Term of patent 14 years
U.S. Cl. D23—28



285,828
FOAM NOZZLE
Thomas Oyler, Johnstown; William J. May, Sipesville, and Glenn I. Beal, Somerset, all of Pa., assignors to Gilmour Manufacturing Co., Somerset, Pa.
Filed Dec. 12, 1983, Ser. No. 560,410
Term of patent 14 years
U.S. Cl. D23—34

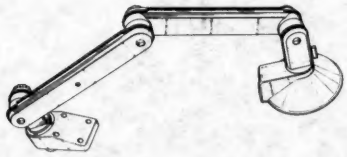
285,829
SOLAR TILE
Kenneth L. Lock, West Pennant Hills, Australia, assignor to Lockland Developments Pty. Ltd., Australia
Filed Aug. 15, 1983, Ser. No. 523,646
Term of patent 14 years
U.S. Cl. D23—72



285,830
HEATER FRONT COVER
Terrill A. Daily, Richardson, Tex., and Louis L. Mastro, Milford, Mich., assignors to Square D Company, Palatine, Ill.
Filed Aug. 31, 1983, Ser. No. 528,295
Term of patent 14 years
U.S. Cl. D23—128

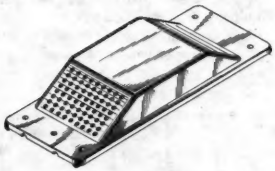
285,831
COAL ASH SEPARATOR
Robert L. Warnke, 2170 W. Drahner, Oxford, Mich. 48051
Filed Jan. 16, 1984, Ser. No. 570,928
Term of patent 14 years
U.S. Cl. D23—131

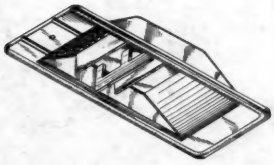
285,832
FUME EXTRACTOR ARM
Bill P. P. Nederman, F.M. Franzén Gata 2, S-252 33 Helsingborg, Sweden
Filed Feb. 13, 1984, Ser. No. 579,594
Claims priority, application Sweden, Aug. 25, 1983, 1983-2169
Term of patent 14 years
U.S. Cl. D23—139



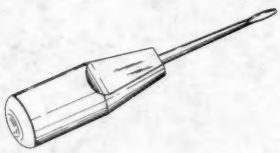
285,833
ADJUSTABLE HANGER FOR IN-TANK TOILET CLEANING DEVICES
Walter M. Ronayne, Westfield, N.J., assignor to American Home Products Corporation (Del), New York, N.Y.
Filed Jan. 3, 1984, Ser. No. 567,604
Term of patent 14 years
U.S. Cl. D23—150

285,834
VENTILATOR FOR CARGO CONTAINER
Paul E. Morgan, Bridgewater, N.J., assignor to CTI International, White Plains, N.J.
Filed Apr. 23, 1984, Ser. No. 603,160
The portion of the term of this patent subsequent to Jun. 10, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—151

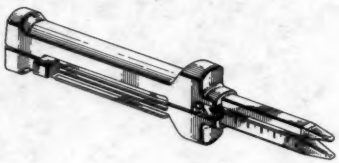




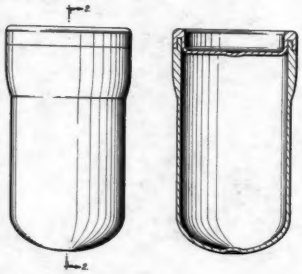
285,835
TOOTH ELEVATOR FOR USE IN EXTRACTIONS
Ulf M. Hanses, Trädgardsgatan 2, S-781 31 Borlänge, Sweden
Filed Feb. 6, 1984, Ser. No. 577,377
Term of patent 14 years
U.S. Cl. D24—10



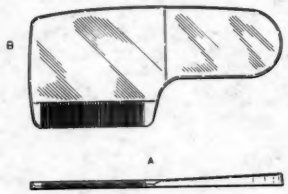
285,836
SURGICAL STAPLER
John V. Hunt, Milford, and Lawrence E. Spreckelmeier, Cincinnati, both of Ohio, assignors to Senmed, Inc., Cincinnati, Ohio
Filed Jan. 7, 1985, Ser. No. 689,466
Term of patent 14 years
U.S. Cl. D24—26



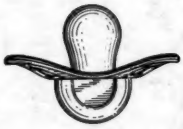
285,837
PHARMACEUTICAL CAPSULE
Fritz Wittwer, Lupsingen, Switzerland, assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 20, 1982, Ser. No. 451,579
Term of patent 14 years
U.S. Cl. D28—2



285,838
COMB
Hugh Smith, Stonehaven, and Donald H. Smith, Aberdeen, both of Scotland, assignors to Albyn of Stonehaven, Ltd., Stonehaven, Scotland
Filed Jul. 30, 1984, Ser. No. 635,586
Claims priority, application United Kingdom, Mar. 16, 1984, 1018576
Term of patent 14 years
U.S. Cl. D28—30

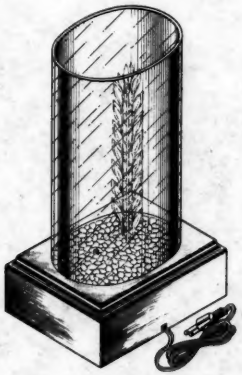


285,839
PACIFIER
Peter Roehrig, Himmelschluesselweg 5, A-1160, Vienna, Austria
Filed Mar. 20, 1984, Ser. No. 591,520
Term of patent 14 years
U.S. Cl. D24—45

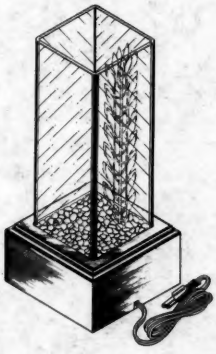


285,840
LANTERN
Tit-Wing Poon, 12F Lam Uk Village, Chaiwan, Hong Kong, Hong Kong
Filed May 6, 1983, Ser. No. 492,292
Claims priority, application United Kingdom, Nov. 17, 1982, 1009754
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—42

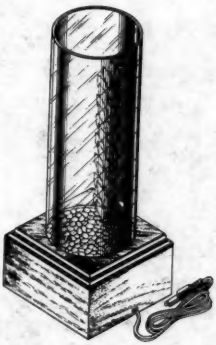
285,841
AQUARIUM
Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Fort Worth, Tex.
Filed Mar. 9, 1984, Ser. No. 587,809
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—8



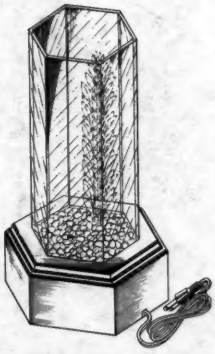
285,842
AQUARIUM
Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Fort Worth, Tex.
Filed Mar. 12, 1984, Ser. No. 588,286
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—8



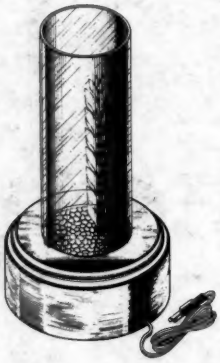
285,843
AQUARIUM
Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Fort Worth, Tex.
Filed Mar. 12, 1984, Ser. No. 588,555
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—8



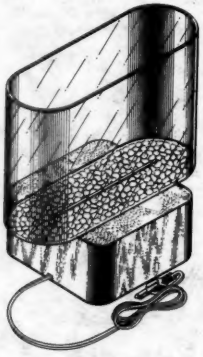
285,844
AQUARIUM
Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Fort Worth, Tex.
Filed Mar. 12, 1984, Ser. No. 588,556
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—8



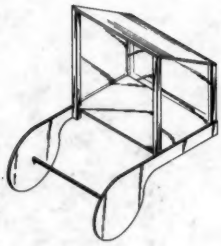
285,845
AQUARIUM
Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Fort Worth, Tex.
Filed Mar. 12, 1984, Ser. No. 588,559
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—8



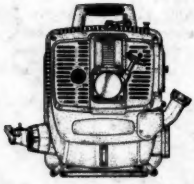
285,846
AQUARIUM
Donald J. Tigert, Fort Worth, Tex., assignor to Unique Gifts, Inc., Fort Worth, Tex.
Filed Jun. 6, 1985, Ser. No. 741,886
Term of patent 14 years
U.S. Cl. D30—8

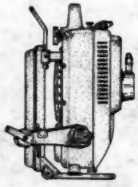


285,847
BIRD FEEDER
Duncan H. Read, Box 183, Rte. 1, Middleburg, Va. 22117
Filed Apr. 10, 1984, Ser. No. 598,763
Term of patent 14 years
U.S. Cl. D30—14

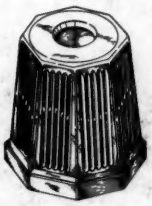


285,848
POWER BLOWER SWEEPER
Giichi Iida, Tokyo, and Yukio Kawaharazuka, Ageo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Sep. 27, 1984, Ser. No. 655,209
Claims priority, application Japan, Apr. 6, 1984, 59-13314
Term of patent 14 years
U.S. Cl. D32—17



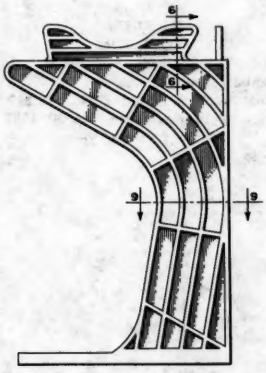


285,849
RECEPTACLE FOR COLLECTING DISPOSABLE WRAPPERS, PACKAGES AND THE LIKE
Philip C. Hughes, 1255 Robert Dickey Pkwy., Dayton, Ohio 45409
Filed Sep. 20, 1984, Ser. No. 652,123
Term of patent 14 years
U.S. Cl. D34—1



285,850
TRASH BAG HOLDER AND DISPENSER
William K. Waldron, 17801 Snow, Dearborn, Mich. 48124
Filed Mar. 16, 1984, Ser. No. 590,270
Term of patent 14 years
U.S. Cl. D34—6

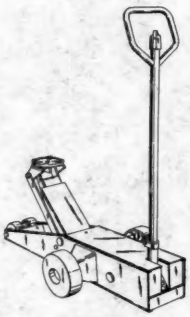
285,851
PLASTIC BAG RACK
James B. Rehrig, 6533 Via Lorenzo, Rancho Palos Verde, Calif. 90274
Filed Mar. 15, 1984, Ser. No. 589,756
Term of patent 14 years
U.S. Cl. D34—6



285,852
CART FOR POTS, PANS, LID AND OTHER KITCHEN UTENSILS
Wardell F. Clark, 716 Washington Pl., Baltimore, Md. 21201
Filed Nov. 25, 1983, Ser. No. 555,181
Term of patent 14 years
U.S. Cl. D34—21

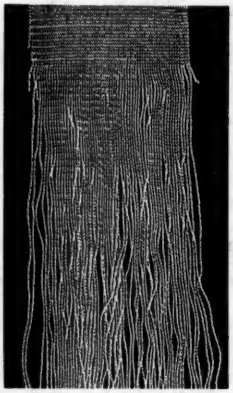
285,853
DROP-LEAF BAR CART
Manfred Hubert, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Oct. 5, 1984, Ser. No. 658,065
Claims priority, application Int'l Pat. Inst., Apr. 19, 1984, DM/003649
Term of patent 14 years
U.S. Cl. D34—21

285,854
VEHICLE SERVICE JACK
Anders Persson, Eskilstuna, Sweden, assignor to Aktiebolaget Bygg-och Transportekonomi (BT) Div. Nike Hydraulics, Eskilstuna, Sweden
Filed Oct. 11, 1984, Ser. No. 660,016
Claims priority, application Sweden, Apr. 19, 1984, 84-1297
Term of patent 14 years
U.S. Cl. D34—31

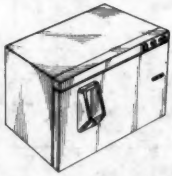


285,855
VEHICLE SERVICE JACK
Anders Persson, Eskilstuna, Sweden, assignor to Aktiebolaget Bygg-och Transportekonomi Division Nike Hydraulics, Eskilstuna, Sweden
Filed Jun. 27, 1984, Ser. No. 624,976
Claims priority, application Sweden, Jan. 4, 1984, 84-0033
Term of patent 14 years
U.S. Cl. D34—31

285,856
CURTAIN
Mirella Fanfani, Via della Fabbrica 8, S.Martino Alla Palma, Scandicci, Florence, and Adriana Daddi, Via Volterrana 8, Cerbaia, S.Casciano Val di Pesa, Florence, both of Italy
Filed Aug. 5, 1982, Ser. No. 405,541
Claims priority, application Italy, Feb. 17, 1982, 11552/82[U]
Term of patent 14 years
U.S. Cl. D6—575



285,857
BANK NOTE WRAPPER
Yoshiaki Nishida, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Mar. 16, 1984, Ser. No. 590,227
Claims priority, application Japan, Sep. 30, 1983, 58-42200
Term of patent 14 years
U.S. Cl. D99—28



285,858

COIN HOLDER

Takeo Ooki, Kawagoe, Japan, assignor to Sakai & Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,918

Term of patent 14 years

U.S. Cl. D99—34

285,859

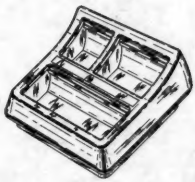
COIN TRAY

Takeo Ooki, Kawagoe, Japan, assignor to Sakai & Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,919

Term of patent 14 years

U.S. Cl. D99—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF SEPTEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

"A" Co.: *See*—
Leibrand, John G., Sr., 4,612,896, Cl. 123-557.000.

A/S N. Foss Electric: *See*—
Pfeiffer, Gottfried, 4,613,568, Cl. 435-23.000.

Aarts, Ronaldus M., to U.S. Philips Corporation. Optical reader with a limiter in the tracking or focus error servo control loop. 4,613,961, Cl. 369-44.000.

Aas, Gunnar: *See*—
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, 4,613,252, Cl. 405-76.000.

AB Mahler & Soner: *See*—
Kjellqvist, Gosta, 4,613,147, Cl. 280-473.000.

Abbott Laboratories: *See*—
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., 4,613,589, Cl. 514-23.000.
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., 4,613,590, Cl. 514-23.000.

Abe, Atsushi: *See*—
Kuwata, Jun; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,613,546, Cl. 428-336.000.

Abe, Hitoshi: *See*—
Takamori, Tsutomu; Nakamura, Yoshiyuki; and Abe, Hitoshi, 4,613,827, Cl. 331-20.000.

Abe, Masahiro: *See*—
Mase, Yasukazu; Abe, Masahiro; Aoyama, Masaharu; and Ajima, Takashi, 4,613,888, Cl. 357-54.000.

Abe, Osamu; and Sugiura, Noboru, to Hitachi, Ltd. Knocking control method and apparatus for internal combustion engine. 4,612,902, Cl. 123-425.000.

Abe, Shinya: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.

Abkowitz, Martin A.: *See*—
Foley, Geoffrey M. T.; Markovics, James M.; Berkes, John S.; Badesha, Santokh S.; and Abkowitz, Martin A., 4,613,557, Cl. 430-59.000.

Abo, Ryo: *See*—
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.

Abrams, Lawrence M. Flow rate sensing device. 4,613,325, Cl. 604-65.000.

Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, to Tsumura Juntendo Inc. Adminiculum for antitumor agents. 4,613,591, Cl. 514-34.000.

Acampora, Lewis A.: *See*—
Sandman, Daniel J.; Stark, James C.; and Acampora, Lewis A., 4,613,468, Cl. 260-550.000.

Adee, James M.; and Frye, John A., to Rohr Industries, Inc. Grit blast drilling of advanced composite perforated sheet. 4,612,737, Cl. 51-310.000.

Adir, S.A.R.L.: *See*—
Regnier, Gilbert; and Poignant, Jean-Claude, 4,613,601, Cl. 514-252.000.

Adisa Service AG: *See*—
Bachmann, Werner, 4,613,922, Cl. 361-215.000.

Advanced Air Systems: *See*—
Pollack, Frank, 4,612,848, Cl. 98-50.000.

Advanced Micro Devices, Inc.: *See*—
Mazumder, Nikhil C., 4,613,774, Cl. 307-463.000.

AE PLC: *See*—
Slee, Roger H., 4,612,833, Cl. 82-18.000.

Aero Product Europa: *See*—
Colonnello, Rino, 4,612,804, Cl. 73-113.000.

Aeschliman, Walter H., to Kar-Glo Industries, Inc. Lamp holder. 4,613,042, Cl. 206-419.000.

Aesculap-Werke AG vormals Jetter & Scheerer: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,612,932, Cl. 128-334.00R.

Aftalion, Sebastian. In line process for sequentially forming and shaping a filament. 4,613,470, Cl. 264-22.000.

Aikens, Paul W., to Du Pont de Nemours, E. I., and Company. Management apparatus for a cable having plural conductors arranged in one or more layered arrays. 4,612,691, Cl. 29-33.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,612,822, Cl. 74-493.000.
Omitsu, Takashi, 4,612,827, Cl. 74-866.000.

Ajiki, Yoshio; and Kajiwara, Shigemasa, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating and interrupting mechanism for internal combustion engine. 4,612,884, Cl. 123-90.160.

Ajima, Takashi: *See*—
Mase, Yasukazu; Abe, Masahiro; Aoyama, Masaharu; and Ajima, Takashi, 4,613,888, Cl. 357-54.000.

Ajinomoto Co., Ltd.: *See*—
Yamazaki, Toshihiko; Murase, Shoji; Suzuki, Katsuyuki; and Iwatsuki, Makoto, 4,613,359, Cl. 71-122.000.

Ajioka, James S.; and Strahan, James V., to Hughes Aircraft Company. Electronically scanned array antenna. 4,613,869, Cl. 343-768.000.

Akers, Charles K.; and Pilie, Roland J., to Calspan Corporation. Method for treating casualties in a contaminated area. 4,612,916, Cl. 128-1.00R.

Akimoto, Koji: *See*—
Nakai, Shoji; and Akimoto, Koji, 4,613,092, Cl. 242-46.400.

Akiyama, Setsuo: *See*—
Oyachi, Tomio; Takahashi, Minoru; Izuhara, Koichi; Akiyama, Setsuo; and Yoshikawa, Masato, 4,613,403, Cl. 156-643.000.

Akiyoma, Susumu: *See*—
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, 4,612,894, Cl. 123-494.000.

Aktiebolaget Leo: *See*—
Carlsson, Jan-Inge L.; Jensen Petersen, Herta G.; and Stamvik, Anders R., 4,613,695, Cl. 564-33.000.

AKZO N.V.: *See*—
Sleigh, Thomas; Savage, David S.; and Clark, John K., 4,613,619, Cl. 514-546.000.

Akzona Incorporated: *See*—
Gerlach, Klaus; Mathes, Nikolaus; Pitowski, Hans-Jurgen; and Wechs, Friedbert, 4,612,688, Cl. 28-104.000.

Alboainin, Ali H. A. Rodent control apparatus. 4,612,724, Cl. 43-73.000.

Alcan International Limited: *See*—
Dewing, Ernest W.; Gesing, Adam J.; Mitchell, David N.; and Pant, Aniket, 4,613,418, Cl. 204-243.00R.
Sivilotti, Olivo G.; and Iseki, Junkichi, 4,613,414, Cl. 204-70.000.

Alcon Laboratories, Inc.: *See*—
Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., 4,613,379, Cl. 134-7.000.

Alexander, David L.: *See*—
Choi, Frank H.; Rein, Samuel W.; and Alexander, David L., 4,612,799, Cl. 73-54.000.

Alexander, William, to American Colloid Company. Method of impregnating a water-penetrable article with a swell-inhibited water swellable clay slurry. 4,613,542, Cl. 428-290.000.

Alfa Romeo Auto S.p.A: *See*—
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, 4,613,206, Cl. 350-174.000.

Alfred Karcher GmbH & Co.: *See*—
Schulze, Werner, 4,613,074, Cl. 239-1.000.

Aliani, Giorgio; Lechat, Jacques B.; and Smits, Jozef A. F., to Exxon Research & Engineering Co. Ethylene copolymers for hot melt systems. 4,613,632, Cl. 523-172.000.

Allied Corporation: *See*—
Deem, Brian C.; and Ott, William E., 4,613,020, Cl. 180-196.00M.
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,613,535, Cl. 428-113.000.
Majewski, Miroslawa, 4,613,806, Cl. 318-696.000.
Shaw, Benjamin C., 4,613,933, Cl. 363-55.000.
Zupancic, Joseph J.; and Swedo, Raymond J., 4,613,440, Cl. 210-490.000.

Almex Ticket Machine Company Limited: *See*—
McCarthy, Paul R., 4,613,747, Cl. 235-480.000.

Alps Electric Co., Ltd.: *See*—
Hosogoe, Junichi; Ida, Yuichi; and Suzuki, Motoyuki, 4,613,853, Cl. 340-710.000.
Nishijima, Akio, 4,613,737, Cl. 200-340.000.
Okita, Masao, 4,613,968, Cl. 369-270.000.
Shimaoka, Motohiro; and Saito, Yukio, 4,613,917, Cl. 360-97.000.
Tamukai, Tadao, 4,613,873, Cl. 346-33.00R.

Alsenz, Richard H. Method and apparatus for controlling capacity of a multiple-stage cooling system. 4,612,776, Cl. 62-175.000.

Althaus, Wolfgang, to Wilkinson Sword Limited. Open razor. 4,612,705, Cl. 30-53.000.

Alvarez, Linda F. Retaining guide for electric iron cord. 4,612,717, Cl. 38-104.000.

Alvarez, Patricio D.: *See*—
Rao, M. Vikram; Kalsi, Manmohan S.; and Alvarez, Patricio D., 4,613,443, Cl. 252-21.000.

Amano, Yoshiaki: *See—*
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Ambasz, Emilio. Ceiling lighting fixture and system. 4,613,930, Cl. 362-223.000.

Amedco Health Care Inc.: *See—*
Mitchell, Larry D., 4,612,679, Cl. 5-425.000.

American Colloid Company: *See—*
Alexander, William, 4,613,542, Cl. 428-290.000.

American Comb Corporation: *See—*
Bachrach, Frank; and Teale, James M., 4,612,944, Cl. 132-11.00R.
Bachrach, Frank, 4,612,945, Cl. 132-137.000.

American Cyanamid Company: *See—*
Floyd, Middleton B., Jr.; and Goidl, Jo A., 4,613,611, Cl. 514-443.000.

American Cycle Industries, Inc.: *See—*
Kirk, Randy W., 4,613,038, Cl. 206-216.000.

American Standard Inc.: *See—*
Hart, James E.; Mong, William K.; Kyllonen, Allen W.; and Krampitz, Mark S., 4,613,016, Cl. 188-52.000.

Ammonia Casale S.A.: *See—*
Zardi, Umberto, 4,613,696, Cl. 564-67.000.

AMP Incorporated: *See—*
Loomis, Phillip E.; Paukovits, Edward J., Jr.; Schuppert, Leo V., Jr.; and Spong, Richard V., 4,612,700, Cl. 29-564.600.

Anderson, Andrew G.: *See—*
McWilliam, Richard D.; Anderson, Andrew G.; McCharles, Donald A.; McLaren, Donald J.; and Yew, Kwang, 4,613,318, Cl. 474-74.000.

Anderson, Erma N. Exercise device for physical therapy. 4,613,131, Cl. 272-146.000.

Anderson, Russell Y.: *See—*
Olin, Daniel C.; Anderson, Russell Y.; and DenBeste, Steven C., 4,613,856, Cl. 340-723.000.

Andersson, Ingmar: *See—*
Nilsson, Nils-Olov; Andersson, Ingmar; Sandberg, Ulrik; and Karlsson, Eils, 4,613,376, Cl. 106-282.000.

Ando, Hirohumi; and Kondo, Takashi, to Nippondenso Co., Ltd. Idling control device for internal combustion engine with turbocharger. 4,612,771, Cl. 60-611.000.

Andra, Hans-Peter: *See—*
Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, 4,612,747, Cl. 52-250.000.

Andra , Rainer; and Hofmann, Manfred, to Metzeler Kautschuk GmbH. Engine bearing which has hydraulic damping. 4,613,117, Cl. 267-140.100.

Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, to Deha Baubedarf GmbH & Co. KG. Connection of a cast-in-place reinforced concrete slab to a prefabricated column. 4,612,747, Cl. 52-250.000.

Andreas Hettich, Firma: *See—*
Eberle, Gunter, 4,612,873, Cl. 118-52.000.

Andresen, Mark E., to International Business Machines Corporation. Centralized generation of data transfer acknowledge pulses for microprocessors. 4,613,936, Cl. 364-200.000.

Andriessen, Ronald C., to Formflo Limited. Making rings from tube or bar stock. 4,612,789, Cl. 72-71.000.

Angerstein, Jorg; and Silber, Dieter, to Licentia Patent-Verwaltungs GmbH; and Telefunken Electronic GmbH. Light controlled triac with lateral thyristor firing complementary main thyristor section. 4,613,884, Cl. 357-39.000.

ANT Nachrichtentechnik GmbH: *See—*
Geissler, Rainer, 4,613,835, Cl. 333-159.000.
Heine, Wilfried, 4,613,834, Cl. 333-120.000.

Antonich, Frederick J.: *See—*
Battocletti, Joseph H.; Halbach, Richard E.; Antonich, Frederick J.; Sances, Anthony, Jr.; and Knox, Thomas A., 4,613,818, Cl. 324-306.000.

Aoyagi, Hidehito; and Hirosaki, Botaro, to NEC Corporation. Selective fading protection system. 4,613,975, Cl. 375-40.000.

Aoyama, Masaharu: *See—*
Mase, Yasukazu; Abe, Masahiro; Aoyama, Masaharu; and Ajima, Takashi, 4,613,888, Cl. 357-54.000.

Aoyama, Tetsuo; Kida, Koichi; and Uchiyama, Takako, to Mitsubishi Gas Chemical Company, Inc. Process for the preparation of carboxylic acid esters. 4,613,684, Cl. 560-179.000.

Apple Adhesives, Inc.: *See—*
Reggio, Carl J., 4,613,515, Cl. 427-1.000.

Applied Materials, Inc.: *See—*
Tam, Simon W.; Reade, Ronald P.; Wong, Jerry Y. K.; and Wang, David N., 4,613,400, Cl. 156-643.000.

Arakawa, Yoshio: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.

Arestov, Vasily P.: *See—*
Konischev, Alexandr I.; Arestov, Vasily P.; Baburin, Vasily I.; and Ilchenko, Ljudmila P., 4,612,849, Cl. 99-277.100.

Arima, Yuusaku: *See—*
Higashi, Hidehiro; Shirono, Katsuhiro; Arima, Yuusaku; Nishimura, Yoichi; and Yoshida, Shinichi, 4,613,425, Cl. 208-89.000.

Arlt, Dieter: *See—*
Klein, Gerhard; and Arlt, Dieter, 4,613,685, Cl. 560-330.000.

Arndt, Lutz; Bachmann, Paul; Berges, Hanns-Peter; Leier, Wolfgang; and Vorberg, Dieter, to Leybold-Heraeus GmbH. Vacuum pump and trap combination. 4,612,957, Cl. 137-565.000.

Arndt, Otto; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of 6-chloro-2,4-dinitroaniline. 4,613,698, Cl. 564-412.000.

Arnold, Ronald G.; and Matras, Edmund J. Polymer concrete block. 4,612,748, Cl. 52-309.160.

Arnoldy, Roman F. Feeder for welds. 4,613,741, Cl. 219-73.200.

Aronson, Jeffry D. Programmable sprinkler. 4,613,077, Cl. 239-97.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Maruzeni, Shoji; Yanagihara, Toshimichi; and Yasuda, Nozomi, 4,613,514, Cl. 426-607.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,613,467, Cl. 260-543.00F.
Kohno, Mitsuo; Katayama, Shigeki; and Matsuda, Kazuo, 4,613,441, Cl. 210-500.360.
Sakata, Norihiko; and Miura, Nobuo, 4,613,626, Cl. 521-60.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Machida, Takeshi; and Komori, Takashi, 4,613,218, Cl. 351-206.000.

Asanaka, Yasumasa: *See—*
Hoshino, Yutaka; Kataoka, Koji; and Asanaka, Yasumasa, 4,613,628, Cl. 521-72.000.

Asars, Juris A.: *See—*
Vaerewyck, Eugene G.; Chen, Cheng-Lin; and Asars, Juris A., 4,613,811, Cl. 324-96.000.

Ashland Oil, Inc.: *See—*
Goel, Anil B.; Richards, Harvey J.; and Grimm, Robert A., 4,613,660, Cl. 528-73.000.
Goel, Anil B., 4,613,662, Cl. 528-137.000.

Ashton, Michael C.; Bish, Derek A.; and Sharman, Stephen G., to Steel Castings Research and Trade Association. Method of casting using expendable patterns. 4,612,968, Cl. 164-34.000.

AT&T Bell Laboratories: *See—*
Ault, Cyrus F., 4,613,861, Cl. 340-825.730.
Curtis, Hazen, III, 4,613,783, Cl. 310-353.000.
Goodby, John W.; and Leslie, Thomas M., 4,613,209, Cl. 350-350.00S.
Halpern, Samuel W., 4,613,990, Cl. 455-33.000.
Laskowski, Edward J.; and Wolowodiuk, Catherine, 4,613,417, Cl. 204-129.850.
Ng, Kwok K.; and Sze, Simon M., 4,613,891, Cl. 357-68.000.
Sherwood, Richard C.; Tabor, William J.; Vogel, Eva M.; and Zappulla, Robert, 4,613,955, Cl. 365-27.000.

AT&T Information Systems Inc.: *See—*
Keverian, Kenneth M., 4,613,987, Cl. 382-65.000.

At&T Technologies, Inc.: *See—*
Smith, James V., Jr., 4,613,521, Cl. 427-169.000.

Ataman, Ergin; and King, J. Thomas, to NCR Canada Ltd. Digital filter for enhancement of document images. 4,613,986, Cl. 382-54.000.

Atkin, Edward; and Williams, Roger L. Baby feed bottles. 4,613,050, Cl. 215-11.00B.

Atlantic Richfield Company: *See—*
Jaecker, John A.; and Johnson, Marvin F. L., 4,613,718, Cl. 585-500.000.
Segalman, Daniel J., 4,612,988, Cl. 166-248.000.

Atsumi, Nobukazu: *See—*
Yonaiyama, Rikio; Kasai, Michio; and Atsumi, Nobukazu, 4,613,647, Cl. 524-514.000.

Auburn Gear: *See—*
Engle, James L., 4,612,825, Cl. 74-711.000.

Audoin, Maurice: *See—*
Yedid, Henri; and Audoin, Maurice, 4,613,983, Cl. 378-99.000.

Ault, Cyrus F., to AT&T Bell Laboratories. Processing system having distributed radiated emissions. 4,613,861, Cl. 340-825.730.

Automated Packaging Systems, Inc.: *See—*
Lerner, Bernard, 4,613,320, Cl. 493-198.000.

Automotive Products plc: *See—*
Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., 4,613,030, Cl. 192-106.200.

Avco Corporation: *See—*
Tate, Michael J., 4,613,280, Cl. 415-17.000.
Vasilos, Thomas, 4,613,522, Cl. 427-202.000.

AVG Productions, Inc.: *See—*
Franke, Sr., John, 4,613,123, Cl. 271-18.300.

Avon Industrial Polymers Limited: *See—*
Smith, Ian P.; Prandle, David L.; Barker, Reginald C.; and Litherland, Robert M. J., 4,613,168, Cl. 285-150.000.

Awerbuch, Leon: *See—*
Rogers, Alfred N.; and Awerbuch, Leon, 4,613,338, Cl. 23-301.000.

Ayres, C. A.; Scott, John N., Jr.; and Sherk, Fred T., to Phillips Petroleum Company. Loop reactor settling leg system for separation of solid polymers and liquid diluent. 4,613,484, Cl. 422-132.000.

Ayton, Ian F., to Orion Industries, Inc. Mounting bracket for rear view mirror with spring detent. 4,613,215, Cl. 350-604.000.

Azukizawa, Teruo: *See—*
Matsuo, Yukito; Tamada, Masuo; Sawafuji, Takashi; and Azukizawa, Teruo, 4,613,805, Cl. 318-687.000.

B. F. Goodrich Company, The: *See—*
Bok, Lowell D., 4,613,017, Cl. 188-71.700.
Cohen, Louis, 4,613,483, Cl. 422-131.000.
Kageorge, Pedro W., 4,613,102, Cl. 244-134.00A.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.

Babcock Power Limited: *See*—
Campbell, John W. E., 4,612,958, Cl. 137-801.000.

Baburin, Vasily I.: *See*—
Konischev, Alexandr I.; Arestov, Vasily P.; Baburin, Vasily I.; and Ilchenko, Ljudmila P., 4,612,849, Cl. 99-277.100.

Bach, Uwe: *See*—
Weiler, Rolf; Thiel, Rudolf; Bach, Uwe; and Panek, Peter, 4,613,018, Cl. 188-72.400.

Bachmann, Paul: *See*—
Arndt, Lutz; Bachmann, Paul; Berges, Hanns-Peter; Leier, Wolfgang; and Vorberg, Dieter, 4,612,957, Cl. 137-565.000.

Bachmann, Werner, to Neo Vac Aktiengesellschaft; and Adisa Service AG. Double-grounded wall tank, and method of its manufacture. 4,613,922, Cl. 361-215.000.

Bachrach, Frank; and Teale, James M., to American Comb Corporation. Comb. 4,612,944, Cl. 132-11.00R.

Bachrach, Frank, to American Comb Corporation. Comb. 4,612,945, Cl. 132-137.000.

Backheim, Tommy. Device for combustion of a fuel and oxygen mixed with a part of the combustion gases formed during the combustion. 4,613,299, Cl. 431-116.000.

Backstein, Guenter; and Unger, Hans W., to Rheinmetall GmbH. Fuse for a satellite projectile. 4,612,858, Cl. 102-245.000.

Badesha, Santokh S.: *See*—
Foley, Geoffrey M. T.; Markovics, James M.; Berkes, John S.; Badesha, Santokh S.; and Abkowitz, Martin A., 4,613,557, Cl. 430-59.000.

Badin, Suzan: *See*—
Delattre, Luc; Moulin, Jean-Francois; and Badin, Suzan, 4,612,732, Cl. 51-101.0LG.

Baggiolini, Enrico; Pizzolato, Giacomo; Uskokovic, Milan; and Truitt, Gary, to Hoffmann-La Roche Inc. Fluorinated vitamin D_3 compounds. 4,613,594, Cl. 514-167.000.

Bagnall-Wild, Ralph H.; and Runciman, Herbert M., to Barr & Stroud Limited. Imaging systems. 4,613,898, Cl. 358-87.000.

Baheti, Radhakisan S.: *See*—
Nied, Herman A.; and Baheti, Radhakisan S., 4,613,743, Cl. 219-130.210.

Bailey, John E.: *See*—
Manners-Smith, John; Thompson, Christopher G.; and Bailey, John E., 4,612,720, Cl. 40-211.000.

Baird, William C., Jr.: *See*—
Swan, George A.; Baird, William C., Jr.; and Corry, Robert G., 4,613,423, Cl. 208-65.000.

Baisch, Roderich; Gose, Horst; and Papiernik, Wolfgang, to Siemens Aktiengesellschaft. Apparatus for measuring positional movement of a numerically controlled machine tool. 4,612,709, Cl. 33-125.00R.

Baker, Gary L., to Crankshaft Machine Company. Multiple spindle machine tool. 4,612,690, Cl. 29-33.00P.

Baker Oil Tools, Inc.: *See*—
Rubbo, Richard P.; and Haugen, David M., 4,612,985, Cl. 166-114.000.

Balchunas, Theodore G.: *See*—
Spencer, David R.; Goldstein, Amnon; Grey, David; Balchunas, Theodore G.; and Kaplan, Arthur B., 4,613,877, Cl. 346-160.000.

Ball Corporation: *See*—
Weiss, Michael A., 4,613,868, Cl. 343-700.0MS.

Ball, Robert J.: *See*—
Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., 4,613,030, Cl. 192-106.200.

Balmer, Clifford J.; and Goddard, Richard, to Vickers Systems S.A. High pressure hydraulic distributor having a mechanically controlled discharge valve. 4,612,846, Cl. 91-457.000.

Banks, Peter B.: *See*—
Holland, David G.; and Banks, Peter B., 4,613,786, Cl. 313-528.000.

Banks, Robert L.: *See*—
Kukes, Simon G.; Nowack, Gerhard P.; and Banks, Robert L., 4,613,719, Cl. 585-528.000.

Barber, Forest C. Drilling apparatus and method. 4,612,922, Cl. 128-92.0EB.

Barber, James C., to James C. Barber and Associates, Inc. Recovery of fluorine from waste gases. 4,613,494, Cl. 423-490.000.

Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., to Leland Stanford Junior University, Board of Trustees of the. Gastrin releasing peptide-like peptides. 4,613,586, Cl. 514-13.000.

Barker, Reginald C.: *See*—
Smith, Ian P.; Prandle, David L.; Barker, Reginald C.; and Litherland, Robert M. J., 4,613,168, Cl. 285-150.000.

Barkhoudarian, Sarkis, to Rockwell International Corporation. Leak locating and mapping system and method. 4,612,797, Cl. 73-40.50R.

Barmag Barmer Maschinenfabrik AG: *See*—
Munnekehoff, Gerd, 4,613,089, Cl. 242-18.0DD.

Barnett, Ronald E.; and Yarger, Ronald G., to General Foods Corporation. Edible material containing m-aminobenzoic acid or salt. 4,613,512, Cl. 426-548.000.

Barr & Stroud Limited: *See*—
Bagnall-Wild, Ralph H.; and Runciman, Herbert M., 4,613,898, Cl. 358-87.000.

Barr, William A. Valve assembly for use in brake pressure control unit. 4,613,189, Cl. 303-6.00C.

Barry Wright Corporation: *See*—
Reynolds, David F., 4,613,316, Cl. 464-85.000.

Barth, Wayne E., to Pfizer, Inc. 6-substituted penicillanic acid 1,1-dioxide compounds. 4,613,462, Cl. 540-310.000.

Barthomeuf, Denise M., to Exxon Research and Engineering Company. Process for separating ethylbenzene from xylenes by selective adsorption on a rubidium substituted X zeolite. 4,613,725, Cl. 585-828.000.

Barton, Jeff B.: *See*—
Iwanczyk, Jan S.; Barton, Jeff B.; Dabrowski, Andrzej J.; and Schnepple, Wayne F., 4,613,756, Cl. 250-361.00R.

Barton, Kenneth E., Jr.: *See*—
Hough, Jack V. D.; Richard, Gordon L.; Barton, Kenneth E., Jr.; DiCarlo, Paul; and Chow, Robert Y., 4,612,915, Cl. 128-1.00R.

Barton, Ronald E.: *See*—
Shenton, Graham; Jones, Ioan G.; Lucas, David W.; and Barton, Ronald E., 4,613,940, Cl. 364-490.000.

Barwood, Anthony J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Harness fasteners. 4,612,687, Cl. 24-574.000.

BASF Aktiengesellschaft: *See*—
Blum, Rainer; and Osterloh, Rolf, 4,613,639, Cl. 524-251.000.
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Hellbach, Hans, 4,613,466, Cl. 560-344.000.
Rebafka, Walter; and Nickels, Helmut, 4,613,683, Cl. 560-67.000.
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, 4,613,095, Cl. 242-198.000.
Thomas, Michael; Neumann, Peter; Wegerle, Dieter; and Krallmann, Reinhold, 4,613,334, Cl. 8-442.000.

Battelle Development Corporation: *See*—
Boiarski, Anthony A.; Fleck, Barbara H.; Meierhoefer, Eugene J.; and Razgaitis, Richard, 4,612,926, Cl. 128-200.210.

Battelle Memorial Institute: *See*—
Verber, Carl M.; Smith, Thomas B.; and Dunson, Philip M., 4,613,204, Cl. 350-96.140.

Battocletti, Joseph H.; Halbach, Richard E.; Antonich, Frederick J.; Sances, Anthony, Jr.; and Knox, Thomas A., to Medical College of Wisconsin, Inc., The. Nuclear magnetic resonance blood flowmeter. 4,613,818, Cl. 324-306.000.

Batty, John R., Jr., to Cordis Corporation. Method for externally programming a device implanted in a patient. 4,613,937, Cl. 364-413.000.

Bauer, Philippe, to Societe Industrielle de Brevets et d'Etudes (S.I.B.E.). Injection valve for an internal combustion engine. 4,613,081, Cl. 239-585.000.

Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, to Leybold-Heraeus GmbH. Evaporator crucible for vacuum depositing systems. 4,613,306, Cl. 432-264.000.

Bauman, Therese M.; and Dietlein, John E., to Dow Corning Corporation. Water-blown silicone foam. 4,613,630, Cl. 521-134.000.

Baumann, John A.: *See*—
Parry, Robert W.; Baumann, John A.; and Schachter, Rozalie, 4,613,485, Cl. 422-173.000.

Baumann, Peter H. Electric-powered spring-return actuating device. 4,613,798, Cl. 318-160.000.

Baumberg, Iosif. Apparatus for elevating liquids including a Venturi pipe and a liquid delay element. 4,613,284, Cl. 417-76.000.

Baxter Travenol Laboratories, Inc.: *See*—
Gokcen, Cem; and Williams, Robert J., 4,613,531, Cl. 428-35.000.

Bay, David L., to GTE Products Corporation. Single transistor oscillator ballast circuit. 4,613,796, Cl. 315-219.000.

Bayer Aktiengesellschaft: *See*—
Beitzke, Bernhard; Handschuh, Volkmar; and Blank, Heinz U., 4,613,692, Cl. 562-495.000.
Hendricks, Udo W.; Lesche, Klaus; Sackmann, Gunter; and Schroer, Wolf-Dieter, 4,613,337, Cl. 8-543.000.
Klein, Gerhard; and Arit, Dieter, 4,613,685, Cl. 560-330.000.
Knofel, Hartmut; and Brockelt, Michael, 4,613,687, Cl. 560-359.000.
Konig, Klaus; Pedain, Josef; and Woynar, Helmut, 4,613,686, Cl. 560-335.000.
Potter, Terry; Thoma, Wilhelm; and Pedain, Josef, 4,613,527, Cl. 427-412.000.
Sirrenberg, Wilhelm; Marhold, Albrecht; and Becker, Benedikt, 4,613,612, Cl. 514-456.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,613,360, Cl. 71-124.000.

Bayerische Metallwerke GmbH: *See*—
Held, Manfred; Leidig, Alfred; Merl, Wilhelm A.; and Stempel, Gunter, 4,613,370, Cl. 75-248.000.

Beattie, Edward J., Jr.: *See*—
Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., 4,613,576, Cl. 436-548.000.

Beccaris, Carlo, to Valeo. Torsion damping device for an automobile clutch friction disc. 4,613,029, Cl. 192-106.200.

Bechtel International Corporation: *See*—
Rogers, Alfred N.; and Awerbuch, Leon, 4,613,338, Cl. 23-301.000.

Beck, Robert J.; and Richardson, Jack, to Diebold, Incorporated. Fascia protective door mechanism. 4,612,864, Cl. 109-49.500.

Becker, Benedikt: *See*—
Sirrenberg, Wilhelm; Marhold, Albrecht; and Becker, Benedikt, 4,613,612, Cl. 514-456.000.

Becker, Richard A.: *See*—
Wight, William W.; and Becker, Richard A., 4,613,436, Cl. 210-232.000.
Becton, Dickinson and Company: *See*—
Szwarc, Joseph M., 4,613,326, Cl. 604-89.000.
Williams, Joel L.; Dunn, Terry S.; O'Connell, James P.; and Montgomery, David, 4,613,517, Cl. 427-2.000.
Beeler, James E. Hydraulic servicing apparatus. 4,612,693, Cl. 29-251.000.
Beers, Howard L., to Tritec, Inc. Board-operated electrical connector for printed circuit boards. 4,613,193, Cl. 339-17.00L.
Behnke, Bert: *See*—
Krohn, Karstes; and Behnke, Bert, 4,613,464, Cl. 260-384.000.
Behrens, William L., to Chrysler Corporation. Automatic transmission shift selector mechanism. 4,612,820, Cl. 74-475.000.
Beitzke, Bernhard; Handschuh, Volkmar; and Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of cinnamic acids which are optionally substituted in the nucleus. 4,613,692, Cl. 562-495.000.
Belko, Robert P.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,613,706, Cl. 568-322.000.
Bell Communications Research, Inc.: *See*—
Gharavi, Hamid, 4,613,948, Cl. 364-526.000.
Bell Helmets Inc.: *See*—
Broerama, Lester V., 4,612,675, Cl. 2-424.000.
Bellamy, John S.; and Elliott, Keith D., to Hazell, Quinton. Ball joint. 4,613,251, Cl. 403-135.000.
Bellemann, Heinrich: *See*—
Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, 4,613,203, Cl. 350-6.600.
Beltrame, Guidalberto. Set of construction elements. 4,612,749, Cl. 52-561.000.
Bender, William M. Small animal intravenous restraint splint. 4,612,925, Cl. 128-133.000.
Bendly, Mariann: *See*—
Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, 4,613,615, Cl. 514-478.000.
Benedek, Vasile; Huckler, Volker; and Ortlepp, Hilmar S., to Deere & Company. Draft vehicle with load sensor and removable support. 4,612,995, Cl. 172-7.000.
Benoist, Francois: *See*—
Grehier, Alain; Rojey, Alexandre; and Benoist, Francois, 4,612,982, Cl. 165-166.000.
Benson, Briant E.; and Brown, Richard D., to Rain Bird Sprinkler Mfg. Corp. Multiple outlet trickle irrigation unit. 4,613,080, Cl. 239-542.000.
Bentley Engineering Company Limited: *See*—
Smith, Arthur R.; and Johnson, Bertram, 4,612,785, Cl. 66-25.000.
Benzoni, Andre J. E., to Lever Brothers Company. Skin treatment composition. 4,613,592, Cl. 514-63.000.
Berendt, Hans-Ulrich; and Schafer, Paul, to Cibs-Geigy Corporation. Process for dyeing or printing cellulose-containing textile material with vat dye foam. 4,613,335, Cl. 8-477.000.
Berg, Hans G.; Holmstrom, Sven A.; and Johansson, Leif, to Boliden Aktiebolag. Method for recovering precious metals. 4,613,365, Cl. 75-83.000.
Berg, Nicolay G.: *See*—
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, 4,613,252, Cl. 405-76.000.
Berg, Robin L.; Morrisette, Douglas; and Ecker, Walter, to Syntechnics, Inc. Reversible latching hinge. 4,613,174, Cl. 292-136.000.
Berger, Jacob: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,613,606, Cl. 514-307.000.
Berger, Maurice; and Bernasconi, Jean-Francois, to Fabriques de Tabac Reunies, S.A. Apparatus for placing pallets on a loading surface. 4,613,032, Cl. 198-409.000.
Berges, Hanns-Peter: *See*—
Arndt, Lutz; Bachmann, Paul; Berges, Hanns-Peter; Leier, Wolfgang; and Vorberg, Dieter, 4,612,957, Cl. 137-565.000.
Bergler, Otto, to Black & Decker Overseas AG. Percussion tool. 4,612,999, Cl. 173-109.000.
Bergman, Hyman C.; Godfrey, James F.; and Gordon, Virginia C., to Preventive Diagnostics Corporation. In vitro test for ocular toxic properties. 4,613,574, Cl. 436-2.000.
Berkes, John S.: *See*—
Foley, Geoffrey M. T.; Markovics, James M.; Berkes, John S.; Badesha, Santokh S.; and Abkowitz, Martin A., 4,613,557, Cl. 430-59.000.
Bernasconi, Jean-Francois: *See*—
Berger, Maurice; and Bernasconi, Jean-Francois, 4,613,032, Cl. 198-409.000.
Bernstrom, Marvin L.; and Zumbusch, Steven J., to Eaton Corporation. Hydraulic motor having free-wheeling and locking modes of operation. 4,613,292, Cl. 418-61.00B.
Berntell, John O., to Mechasical Technology Incorporated. Power control system for a hot gas engine. 4,612,769, Cl. 60-521.000.
Berretti, Giorgio. Wet-shaving unit with handle forming seats for shaving heads. 4,612,704, Cl. 30-47.000.
Besenyei, Gabor: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.
Best, Walter E. Adjustable limb support. 4,612,919, Cl. 128-77.000.
Bethea, Paul M.: *See*—
Traut, G. Robert; Keahey, Frank S., Jr.; Kozakoff, Dennis J.; Bethea, Paul M.; and Hensel, Joseph D., 4,613,540, Cl. 428-212.000.
Bettman, Ralph B., to Spectra-Physics, Inc. Resonant cavity structure for ion laser with floating plate for mirror adjustment. 4,613,972, Cl. 372-107.000.
Beuther, Harold; Kibby, Charles L.; Kobylinski, Theddeus P.; and Pannell, Richard B., to Chevron Research Company. Conversion of syathesis gas to diesel fuel and catalyst therefor. 4,613,624, Cl. 518-715.000.
Bevilacqua, Joseph. Wall and foundation drainage construction. 4,612,742, Cl. 52-169.500.
Bhatia, Rajkumar P.: *See*—
Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., 4,613,379, Cl. 134-7.000.
Bianchi, John E. Cartridge belt. 4,613,068, Cl. 224-242.000.
Bickley, Robert H.; and Broughton, Christopher D., to Motorola, Inc. Rapid acquisition, tracking PLL with fast and slow sweep speeds. 4,613,825, Cl. 331-4.000.
Bielefelder Kuchenmaschinen-und Transportgeratefabrik GmbH: *See*—
vom Brsucke, Manfred; and vom Brsucke jun, Hans, 4,613,272, Cl. 414-347.000.
Billy Pugh Co., Inc.: *See*—
Pugh, Billy G., 4,613,096, Cl. 244-1.00R.
Bilsing, Alfred. Conveyor robot. 4,613,278, Cl. 414-736.000.
Bio-Rad Laboratories, Inc.: *See*—
Fernwood, George G.; and Burd, Samuel, 4,612,710, Cl. 34-16.000.
Biomass Limited: *See*—
McKeown, Kevin J., 4,613,433, Cl. 210-150.000.
Birnboim, Hyman C.: *See*—
Ing, Harry; and Birnboim, Hyman C., 4,613,758, Cl. 250-474.100.
Bish, Derek A.: *See*—
Ashton, Michael C.; Bish, Derek A.; and Sharman, Stephen G., 4,612,968, Cl. 164-34.000.
Bither, Peter G., to Hercules Incorporated. Composition for preparing paperboard container for liquids. 4,613,635, Cl. 524-14.000.
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , to Sanofi. Compounds with a nitrogen-containing heterocyclic nucleus, and drugs in which they are present. 4,613,603, Cl. 514-242.000.
Black & Decker Inc.: *See*—
Sanders, Anthony J., 4,613,781, Cl. 310-239.000.
Wheeler, Dale K., 4,612,702, Cl. 29-596.000.
Black & Decker Overseas AG: *See*—
Bergler, Otto, 4,612,999, Cl. 173-109.000.
Blank, Heinz U.: *See*—
Beitzke, Bernhard; Handschuh, Volkmar; and Blank, Heinz U., 4,613,692, Cl. 562-495.000.
Blass, Judd; and Keren, Hanan, to Elscint, Ltd. Multiple feed Rf coils. 4,613,837, Cl. 333-219.000.
Blatchford, Michael I., to Ralph Blatchford & Co. Ltd. Vehicle with load handling apparatus. 4,613,276, Cl. 414-542.000.
Blizzard, John D.; and VanWert, Bernard, to Dow Corning Corporation. Bonding surfaces with permanent-bond adhesive. 4,613,534, Cl. 428-57.000.
Blohm & Voss AG: *See*—
Poppe, Horst, 4,612,869, Cl. 114-293.000.
Blomqvist, Klas I., to U.S. Philips Corporation. Arrangement in a tunable high frequency transmitter tube. 4,613,788, Cl. 315-39.610.
Blood, Ernest B., to McDonnell Douglas Corporation. Three dimensional digitizer with electromagnetic coupling. 4,613,866, Cl. 343-448.000.
Blosl, Siegfried; Bruns, Klaus; and Schaper, Ulf-Armin, to Henkel Kommanditgesellschaft auf Aktien. 2-methyl pentanoic acid esters and perfume compositions containing them. 4,613,457, Cl. 252-522.00R.
Bloss, Werner: *See*—
Herden, Werner; and Bloss, Werner, 4,613,789, Cl. 315-58.000.
Blum, Rainer; and Osterloh, Rolf, to BASF Aktiengesellschaft. Preparation of plastisols and organosols having a long shelf life. 4,613,639, Cl. 524-251.000.
Blumberg, Shmaryahum: *See*—
Kesaler, Efrat; Spierer, Abraham; and Blumberg, Shmaryahum, 4,613,587, Cl. 514-19.000.
Bock, Ortwin: *See*—
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,613,584, Cl. 502-304.000.
Boda, Gabor: *See*—
Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, 4,613,615, Cl. 514-478.000.
Bodicky, Raymond O., to Sherwood Medical Company. Catheter placement device. 4,613,329, Cl. 604-158.000.
Boehmer, Dennis A.: *See*—
Edwards, Floyd V.; and Boehmer, Dennis A., 4,612,960, Cl. 137-846.000.
Boehringer Mannheim GmbH: *See*—
Geisler, Edda; Feuerstein, Helmut; and Lange, Hans, 4,613,569, Cl. 435-26.000.
Boeing Company, The: *See*—
Byford, Frank, 4,612,844, Cl. 91-363.00A.
Herndon, Gerald F., 4,613,101, Cl. 244-122.00R.
Jeppson, Jan, 4,613,800, Cl. 318-434.000.

Smith, Keith O.; and Glancy, Jerry L., 4,613,099, Cl. 244-53.00R.
Woods, Quentin T., 4,613,262, Cl. 409-211.000.

Boiarski, Anthony A.; Fleck, Barbara H.; Meierhoefer, Eugene J.; and Razgaitis, Richard, to Battelle Development Corporation. Dual-range aspirator device. 4,612,926, Cl. 128-200.210.

Boisseau, Alain: *See*—
Marcon, Joel; Durant, Jacques; Simon, Georges; and Boisseau, Alain, 4,612,843, Cl. 89-33.040.

Bok, Lowell D., to B. F. Goodrich Company, The. Disk brake and method of assembly. 4,613,017, Cl. 188-71.700.

Boliden Aktiebolag: *See*—
Berg, Hans G.; Holmstrom, Sven A.; and Johansson, Leif, 4,613,365, Cl. 75-83.000.

Boller, Arthur; Germann, Alfred; Petrzilka, Martin; and Schadt, Martin, to Hoffmann-La Roche Inc. Coloring substance-containing liquid crystal mixtures. 4,613,208, Cl. 350-349.000.

Bollinger, Arthur: *See*—
Bowers, Thomas, 4,612,686, Cl. 24-71.100.

Bollinger, James E.: *See*—
Kamen, Christopher R.; and Bollinger, James E., 4,612,967, Cl. 150-52.00K.

Bombardieri, Caurino C.: *See*—
Rakach, Alec; and Bombardieri, Caurino C., 4,612,989, Cl. 166-263.000.

Bonfilio, Roberto L. Rotating cylinder internal combustion engine. 4,612,882, Cl. 123-44.00R.

Bonifaz, Cristobal; Corbin, David R.; and Parise, John B., to Du Pont de Nemours, E. I., and Company. Boron-treated zeolite catalyst for preparing light monoolefins. 4,613,720, Cl. 585-640.000.

Bonke, Knut: *See*—
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, 4,613,252, Cl. 405-76.000.

Booher, Benjamin V. Composite transverse beam and spring system for an automobile. 4,613,152, Cl. 280-669.000.

Boon, Anthony J.: *See*—
Wishart, Scott A.; Pecak, Tadeusz; Wilson, Owen H.; and Boon, Anthony J., 4,613,127, Cl. 271-274.000.

Borkan, William N. Non-invasive multiprogrammable tissue stimulator. 4,612,934, Cl. 128-421.000.

Borsodi Vegyi Kombinat: *See*—
Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, 4,613,615, Cl. 514-478.000.
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.

Boscacci, William L., to Lucasey Manufacturing Company. Appliance security device. 4,613,109, Cl. 248-553.000.

Bosshart, George S.: *See*—
Packer, Louis L.; Bosshart, George S.; Jaworowski, Mark R.; and Kuntz, Urban E., 4,613,259, Cl. 406-14.000.

Bottaccio, Giorgio: *See*—
Marraccini, Antonio; Carlini, Filippo M.; Bottaccio, Giorgio; Pasquale, Antonio; and Maranzana, Giorgio, 4,613,667, Cl. 546-14.000.

Boumendil, Jean-Jack: *See*—
Pescatore, Richard; and Boumendil, Jean-Jack, 4,612,712, Cl. 34-68.000.

Bourgeois, Ronald D. Roller conveyor with improved comb structure. 4,613,036, Cl. 198-633.000.

Bouvot, Jean-Francois; and LeBorgne, Jose , to Valeo. Vacuum control device for the displacement of an element between at least three positions. 4,612,847, Cl. 92-13.100.

Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, to Kennecott Corporation. Method and apparatus for the continuous production of strip using oscillating mold assembly. 4,612,971, Cl. 164-454.000.

Bowers, Thomas, to Bollinger, Arthur; Durst, Fred C., Jr.; and Emch, Schaffer, Schaub & Porcello Co. Strap tightener. 4,612,686, Cl. 24-71.100.

Boyd, Cecil. Bio-medical injector apparatus. 4,613,328, Cl. 604-156.000.

BP Chemicals Limited: *See*—
Ray, David J. M., 4,613,693, Cl. 562-517.000.

Brady, Thomas P.: *See*—
Langer, Horst G.; Brady, Thomas P.; Paul, Marsha A.; and Doorakian, George A., 4,613,661, Cl. 528-108.000.

Brandt, Wilbur. Elevated signal indicator for a motor vehicle. 4,613,927, Cl. 362-32.000.

Branston, Randolph E.: *See*—
Ober, Christopher K.; Lok, Kar P.; Hair, Michael L.; and Branston, Randolph E., 4,613,559, Cl. 430-137.000.

Branz, Michael A.; and Renaud, Paul F., to Kysor Industrial Corporation. Refrigeration monitor and alarm system. 4,612,775, Cl. 62-126.000.

Brass, Stephen; Croudace, Michael C.; and Wusz, Timothy, to Union Oil Company of California. Method for control of octane requirement increase in an internal combustion engine having manifold and/or combustion surfaces which inhibit the formation of engine deposits. 4,612,880, Cl. 123-1.00A.

Brault, Roland, to Thomson-CSF. Printed card with impressions. 4,613,924, Cl. 361-403.000.

Brembo S.p.A.: *See*—
Giorgetti, Alberto, 4,613,019, Cl. 188-73.310.

Bremer, Paul W. Head fixation apparatus including crown and skull pin. 4,612,930, Cl. 128-303.00B.

Bridger, Robert F., to Mobil Oil Corporation. Alpha-olefin polymers as lubricant viscosity properties improvers. 4,613,712, Cl. 585-10.000.

Bridgestone Corp.: *See*—
Oyachi, Tomio; Takahashi, Minoru; Izuhara, Koichi; Akiyama, Setsuo; and Yoshikawa, Masato, 4,613,403, Cl. 156-643.000.

Brieger, Emmet F.: *See*—
Vann, Roy R.; and Brieger, Emmet F., 4,612,992, Cl. 166-297.000.

Briley, George C.; and Pao, Peter Y. M., to Refrigeration Engineering Corporation. Apparatus for air treating articles carried on a spiral conveyor. 4,612,780, Cl. 62-381.000.

Brinkerhoff, Ronald J.; and Nobis, Rudolph H., to Senmed, Inc. Multiple-load cartridge assembly for a linear surgical stapling instrument. 4,612,933, Cl. 128-334.00R.

Brisco, David P., to Halliburton Company. Coupling device. 4,613,161, Cl. 285-18.000.

Brisko, Frank S. Hydraulically actuated valve train for an internal combustion engine. 4,612,883, Cl. 123-90.130.

British Columbia Telephone Company: *See*—
Sewerinson, Ake; and Hellquist, Andrew V., 4,613,976, Cl. 375-52.000.

British Petroleum Company p.l.c., The: *See*—
McNiff, Timothy K., 4,613,716, Cl. 585-415.000.

Brockelt, Michael: *See*—
Knofel, Hartmut; and Brockelt, Michael, 4,613,687, Cl. 560-359.000.

Broden, David A., to Rosemount Inc. Stress reducing stop for unstretched pressure sensing diaphragm. 4,612,812, Cl. 73-718.000.

Broersma, Lester V., to Bell Helmets Inc. Helmet with adjustable ventilation. 4,612,675, Cl. 2-424.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Iwase, Takayuki; and Ohashi, Tsuneo, 4,613,248, Cl. 400-697.100.
Sugiura, Toshiro; Morita, Toshiki; and Takenaka, Koichi, 4,613,246, Cl. 400-320.000.

Broughton, Christopher D.: *See*—
Bickley, Robert H.; and Broughton, Christopher D., 4,613,825, Cl. 331-4.000.

Browder, Jerald L.: *See*—
Fosdick, Frank D., Jr.; and Browder, Jerald L., 4,612,986, Cl. 166-171.000.

Brown, Dennis N. Orthotic for athletic use. 4,612,713, Cl. 36-44.000.

Brown, Richard D.: *See*—
Benson, Briant E.; and Brown, Richard D., 4,613,080, Cl. 239-542.000.

Brown University Research Foundation: *See*—
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, 4,613,604, Cl. 514-274.000.
Risen, William M., Jr.; and Kamitsos, Efstratios I., 4,613,553, Cl. 430-2.000.

Bruce, James A.; and Narechania, Rajesh G., to International Business Machines Corporation. Adhesion characterization test site. 4,612,805, Cl. 73-150.00A.

Bruer, Manfred. Embankment stabilizing brick. 4,613,255, Cl. 405-286.000.

Brugger, Rudolf; Jonke, Gerhard; and Steinmann, Peter, to Siemens Aktiengesellschaft. Optical device for viewing the adjustment of optical waveguides. 4,613,214, Cl. 350-511.000.

Brumme, Gerhard; Grage, Ludger; Heynisch, Hinrich; and Hubner, Erwin, to Siemens Aktiengesellschaft. Transversely excited gas laser. 4,613,971, Cl. 372-87.000.

Bruns, Klaus: *See*—
Blosl, Siegfried; Bruns, Klaus; and Schaper, Ulf-Armin, 4,613,457, Cl. 252-522.00R.

Bubat, Alfred: *See*—
Haubennestel, Karlheinz; and Bubat, Alfred, 4,613,641, Cl. 524-267.000.

Bucher, Christian: *See*—
Kopf, Helmut; and Bucher, Christian, 4,613,496, Cl. 424-14.000.

Buchholz, Rainer, to Jagenberg AG. Equipment for applying a blank of foil to bottles. 4,613,397, Cl. 156-476.000.

Buchi, George H.; and Wuest, Hans, to Firmenich SA. Process for the preparation of (+)-3a-6,6,9a-tetramethylperhydronaphto[2,1-b]furan. 4,613,710, Cl. 568-819.000.

Budreau, Paul A. Ice cooled fan screen apparatus and method. 4,612,774, Cl. 62-59.000.

Buhlmayer, Peter: *See*—
Fuhrer, Walter; Buhlmayer, Peter; Rasetti, Vittorio; and Riniker, Bernhard, 4,613,676, Cl. 560-39.000.

Bulgarelli, Vittorio, to Osmano, Beltrami. Trolley mounted, hand-propelled home/professional digger, or 'mini-digger'. 4,612,716, Cl. 37-103.000.

Buna, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Air suspension. 4,613,116, Cl. 267-64.250.

Burd, Lamar; Miller, Evan R.; Carozza, Eugene J.; and Grunstra, Robert E., to Howmet Turbine Components Corporation. Method of and apparatus for casting articles with predetermined crystalline orientation. 4,612,969, Cl. 164-122.200.

Burd, Samuel: *See*—
Fernwood, George G.; and Burd, Samuel, 4,612,710, Cl. 34-16.000.

Burke Marketing Services, Inc.: *See*—
Vogel, John D., 4,613,219, Cl. 351-209.000.

Burkel, Rainer; and Zieher, Peter, to Robert Bosch GmbH. Electromagnetically operated dual-valve flow-control assembly. 4,612,845, Cl. 91-448.000.

Burkey, Bruce C.; VanHeyningen, Roger S.; Spaulding, Richard A.; and Wolf, Edward L., to Eastman Kodak Company. Color respon-

sive imaging device employing wavelength dependent semiconductor optical absorption. 4,613,895, Cl. 358-41.000.

Burleigh, Malcolm B., to Minnesota Mining and Manufacturing Co. Waterproof, moisture-vapor permeable sheet material and method of making the same. 4,613,544, Cl. 428-315.500.

Burroughs Corporation: *See*—
Gal, Laszlo V., 4,613,771, Cl. 307-443.000.
Holz, George E.; and Ogle, James A., 4,613,854, Cl. 340-714.000.
Sheth, Jayesh V., 4,613,954, Cl. 364-900.000.

Burry-Lu, Inc.: *See*—
Price, Floyd W.; and Vest, Richard, 4,612,852, Cl. 99-450.400.

Burton, Lester P. J., to Ethyl Corporation. Thermally stable phenolic compounds. 4,613,642, Cl. 524-349.000.

Bush, John M.; and Ruhberg, David L., to NCR Corporation. Paging register for memory devices. 4,613,953, Cl. 364-900.000.

Bushyhead, Jess C.; Kolster, Harvey L.; Lowry, Michael G.; and Wolf, Fred C., to Hallmark Cards, Incorporated. Small article display assembly. 4,613,047, Cl. 211-55.000.

Butler, John D., to Federal-Mogul Corporation. Dual-lip shaft seal with one spring-urged lip. 4,613,143, Cl. 277-134.000.

Button Sling, Inc.: *See*—
Gann, Larry N., 4,613,067, Cl. 224-150.000.

Byford, Frank, to Boeing Company, The. Fail-passive actuator control. 4,612,844, Cl. 91-363.00A.

BYK-Chemie GmbH: *See*—
Haubennestel, Karlheinz; and Bubat, Alfred, 4,613,641, Cl. 524-267.000.

C. A. Parshall, Inc.: *See*—
Levy, Leon M., 4,613,220, Cl. 352-78.00R.

Cabler, Paul S.: *See*—
Drapp, Donald J.; and Cabler, Paul S., 4,613,349, Cl. 55-458.000.

Cahen, Raymond M.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,613,724, Cl. 585-824.000.

Calabresi, Paul: *See*—
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, 4,613,604, Cl. 514-274.000.

Calgon Corporation: *See*—
Gill, Jasbir S.; and Friedman, Arthur J., 4,613,481, Cl. 422-16.000.

Calspan Corporation: *See*—
Akers, Charles K.; and Pilie, Roland J., 4,612,916, Cl. 128-1.00R.

Campbell, John W. E., to Babcock Power Limited. Boiler safety valve installations. 4,612,958, Cl. 137-801.000.

Campman, Keith S., to Dowell Schlumberger Incorporated. Flow meter and densitometer apparatus. 4,612,814, Cl. 73-861.720.

Canadian Fram Limited: *See*—
McWilliam, Richard D.; Anderson, Andrew G.; McCharles, Donald A.; McLaren, Donald J.; and Yew, Kwang, 4,613,318, Cl. 474-74.000.

Canadian Patents and Development Limited: *See*—
Ing, Harry; and Birnboim, Hyman C., 4,613,758, Cl. 250-474.100.

Cannon, William N., to Eli Lilly and Company. Novel oxiodinium and thiaiodinium compounds. 4,613,620, Cl. 514-570.000.

Canon Kabushiki Kaisha: *See*—
Honjo, Takeshi, 4,613,227, Cl. 355-14.00C.
Ichikawa, Izumi; and Sato, Hideaki, 4,613,964, Cl. 369-45.000.
Kawabata, Takashi, 4,613,225, Cl. 354-403.000.
Miyake, Hiroyuki; and Yonemori, Takaji, 4,613,229, Cl. 355-15.000.
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,613,558, Cl. 430-84.000.
Suzuki, Koji; and Kawatsura, Yoshihiro, 4,613,228, Cl. 355-14.00R.
Tobe, Kazumitsu, 4,613,909, Cl. 358-310.000.

Cantor, Harvey I.; and Nabel, Gary, to Dana-Farber Cancer Institute. Lymphocyte growth factor. 4,613,459, Cl. 530-351.000.

Cantrell, John L., to Ribi ImmunoChem Research, Inc. Pyridine-soluble extracts of microorganisms. 4,613,504, Cl. 424-195.100.

Capdeboscq, Bernard; and Cuzin, Marc, to S.A. Martin. Process and apparatus for the automatic supply of a machine for processing products in the form of sheets. 4,613,268, Cl. 414-114.000.

Capewell, Terence J.: *See*—
Fairbairn, Terence W. F.; and Capewell, Terence J., 4,613,023, Cl. 192-8.00R.

Carbide Blast Joints, Inc.: *See*—
Kuhne, Karl F., 4,613,165, Cl. 285-45.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Fuerter, Gerhard; and Lahres, Hans, 4,613,217, Cl. 351-176.000.

Carlini, Filippo M.: *See*—
Marraccini, Antonio; Carlini, Filippo M.; Bottaccio, Giorgio; Pasquale, Antonio; and Maranzana, Giorgio, 4,613,667, Cl. 546-14.000.

Carlson, Leroy H., Jr.: *See*—
Kesten, Martin; Carlson, Leroy H., Jr.; and Kwader, Gary L., 4,613,321, Cl. 493-342.000.

Carlsson, Jan-Inge L.; Jensen Petersen, Herta G.; and Stamvik, Anders R., to Aktiebolaget Leo. N-nitroso compounds and compositions containing such compounds. 4,613,695, Cl. 564-33.000.

Carlton, Robert E. Portable storage kit for household cleansers. 4,613,041, Cl. 206-373.000.

Caroll, James E.; and Zillig, Steven R., to Zillig, Steven R. Fluid coupling, seal removal tool and method. 4,612,953, Cl. 137-327.000.

Carozza, Eugene J.: *See*—
Burd, Lamar; Miller, Evan R.; Carozza, Eugene J.; and Grunstra, Robert E., 4,612,969, Cl. 164-122.200.

Carraher, Charles E., Jr.: *See*—
Schroeder, Jack A.; Carraher, Charles E., Jr.; and Schwarz, Richard A., 4,613,670, Cl. 549-211.000.

Carrion, Nereida: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.

Carter, Charles G.; and Lee, David L., to Stauffer Chemical Company. N,N-disubstituted hydroxylamine esters of substituted pyridyloxy-phenoxypropionic acids and herbicidal methods of use. 4,613,357, Cl. 71-94.000.

Cartner, Jack O. Ditching apparatus with improved ditching blade. 4,612,715, Cl. 37-92.000.

Casati, Paolo; Elefante, Biagio; and Fuganti, Claudio, to DE.BI Derivati Biologici International S.p.A. Process for preparing α-L-aspartyl-L-phenylalanine methyl ester. 4,613,460, Cl. 560-41.000.

Casella, Victor M.; and Fong, Ronald A., to Clorox Company, The. Controlled generation hypochlorite compositions and method. 4,613,332, Cl. 8-111.000.

Cash, David L.: *See*—
Duchane, David V.; and Cash, David L., 4,613,629, Cl. 521-82.000.

Casio Computer Co., Ltd.: *See*—
Sunada, Takuya, 4,612,839, Cl. 84-1.010.

Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, to Aesculap-Werke AG vormals Jetter & Scheerer. Magazine for C-shaped scalp clips. 4,612,932, Cl. 128-334.00R.

Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., to Ciba-Geigy Corporation. Preparation of 1,4-diketopyrrolo-[3,4-c]pyrroles. 4,613,669, Cl. 546-167.000.

Castel, Yvon; and Iato, Michel, to Societe Nationale Elf Aquitaine (Production). Device for connecting a collecting head input to the well head output by means of a mobile connector connected to a looped duct. 4,612,994, Cl. 166-344.000.

Castelnau, Laurent: *See*—
Soucille, Michel; Castelnau, Laurent; and Traiteur, Rene M., 4,612,976, Cl. 165-70.000.

Catalysts & Chemicals Industries Co., Ltd.: *See*—
Higashi, Hidehiro; Shirono, Katsuhiro; Arima, Yuusaku; Nishimura, Yoichi; and Yoshida, Shinichi, 4,613,425, Cl. 208-89.000.

Caterpillar Inc.: *See*—
Engquist, Karl R.; and Klintworth, Keith K., 4,612,767, Cl. 60-321.000.
Livesay, Richard E., 4,612,765, Cl. 59-7.000.

Caterpillar Industrial Inc.: *See*—
Paine, John C., 4,613,939, Cl. 364-424.000.

Catros, Jean-Yves; Chapuis, Franck; and Malo-Renault, Francois, to Thomson-CSF. Method and device for detection of moving points in a television image for digital television systems providing bit-rate compression, with conditional-replenishment. 4,613,894, Cl. 358-13.000.

Cattanach, James B.; and Jones, Anthony E., to Imperial Chemical Industries PLC. Method for forming reinforced thermoplastic composites. 4,613,393, Cl. 156-323.000.

Cavanagh, Michael J., to Minnesota Mining and Manufacturing Company. Blister pack laminating device and method. 4,612,755, Cl. 53-485.000.

Cavicchi, Dario: *See*—
Manservisi, Renato; and Cavicchi, Dario, 4,612,803, Cl. 73-81.000.

Cejn AG: *See*—
Schattmaier, Kurt, 4,613,172, Cl. 285-340.000.

Celanese Corporation: *See*—
McKie, Derrick B., 4,613,634, Cl. 523-223.000.
Strong, James R., 4,613,701, Cl. 568-454.000.

Central Glass Company, Limited: *See*—
Narita, Tadashi; Hagiwara, Tokio; and Hamana, Hiroshi, 4,613,657, Cl. 526-204.000.

Ceskoslovenska akademie ved: *See*—
Turkova, Jaroslava; and Stamberg, Jiri , 4,613,502, Cl. 424-94.000.

Cha, Sungman: *See*—
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, 4,613,604, Cl. 514-274.000.

Chalik, Lazar. Gear assembly. 4,612,816, Cl. 74-401.000.

Chambon, Jean-Pierre: *See*—
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , 4,613,603, Cl. 514-242.000.

Champion Spark Plug Company: *See*—
Gimple, James J.; and Lasley, Charles T., 4,613,082, Cl. 239-690.000.

Chang, Jaw-Kang: *See*—
Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., 4,613,586, Cl. 514-13.000.

Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., to General Electric Company. Tri-nickel aluminide compositions alloyed to overcome hot-short phenomena. 4,613,368, Cl. 75-246.000.

Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., to General Electric Company. Tri-nickel aluminide composition processing to increase strength. 4,613,480, Cl. 419-30.000.

Chang, Wen-Hsuan; and McKeough, David T., to PPG Industries, Inc. Gelable blends of organosilicon-containing materials and hydrophobic polyols. 4,613,451, Cl. 252-182.000.

Chapman, William L.: *See*—
Newlin, Larry L.; and Chapman, William L., 4,613,980, Cl. 375-116.000.

Chapuis, Franck: *See*—
Catros, Jean-Yves; Chapuis, Franck; and Malo-Renault, Francois, 4,613,894, Cl. 358-13.000.
Chauvin, Yves; Commereuc, Dominique; Cruypelinck, Daniel; Hugues, Francois; and Vidouta, Georges, to Institut Francais du Petrole. Process for removing nickel, aluminum and chlorine from olefin oligomers. 4,613,726, Cl. 585-861.000.
Chavkin, Leonard, to Health Products Development, Inc. Dry, water-foamable pharmaceutical compositions. 4,613,497, Cl. 424-44.000.
Cheek, Alton E. Directional drilling azimuth control system. 4,612,987, Cl. 166-212.000.
Chemische Werke Huls AG: *See*—
Michel, Klaus; and Gude, Armin, 4,613,532, Cl. 428-36.000.
Chen, Cheng-Lin: *See*—
Vaerewyck, Eugene G.; Chen, Cheng-Lin; and Asars, Juris A., 4,613,811, Cl. 324-96.000.
Chen, Jie, to Dow Corning Corporation. Method for removing lipid deposits from contact lenses. 4,613,380, Cl. 134-30.000.
Chen, Richard M. Orientation and control system for robots. 4,613,942, Cl. 364-513.000.
Cheney, M. Charles, to Foxboro Company, The. Constant temperature heating value measurement apparatus. 4,613,482, Cl. 422-51.000.
Cheney, Richard F.; and Pierce, Richard H., to GTE Products Corporation. Method for making ultrafine metal powder. 4,613,371, Cl. 75-255.000.
Cheng, Bao-Ding, to Colgate-Palmolive Co., The. Detergent compositions. 4,613,448, Cl. 252-157.000.
Chenot, Charles F., to GTE Products Corporation. Compensatory procedure for preparing haloapatite phosphors. 4,613,453, Cl. 252-301.60P.
Cherry, Peter J.; and Freeman, Barrie A., to Ciba-Giegy AG. Method of and apparatus for treating with a liquid a sheet of flexible photographic material having a photographic emulsion on one face thereof. 4,613,223, Cl. 354-322.000.
Chevron Research Company: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Theddeus P.; and Pannell, Richard B., 4,613,624, Cl. 518-715.000.
Papir, Yoram S.; and Schroeder, Albert H., 4,613,211, Cl. 350-357.000.
Chiang, Shiao-Hung; and Klinzing, George E., to University of Pittsburgh. Process for removing mineral matter from coal. 4,613,429, Cl. 209-5.000.
Chiba, Akira: *See*—
Tate, Susumu; Hashimoto, Hiroshi; and Chiba, Akira, 4,613,664, Cl. 528-274.000.
Chiba, Yoshinori: *See*—
Yamaguchi, Kimio; and Chiba, Yoshinori, 4,612,936, Cl. 128-644.000.
Chicago Rawhide Manufacturing Co.: *See*—
Olsson, Burton K., 4,613,005, Cl. 175-371.000.
Chiong, Kaolin N.; Yang, Bea-Jane L.; and Yang, Jer-Ming, to International Business Machines Corporation. Formation of etch-resistant resists through preferential permeation. 4,613,398, Cl. 156-628.000.
Chiro, Henry J. Nutcracker apparatus. 4,612,854, Cl. 99-579.000.
Chisso Corporation: *See*—
Yonaiyama, Rikio; Kasai, Michio; and Atsumi, Nobukazu, 4,613,647, Cl. 524-514.000.
Chiu, Fang-Ting: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,613,606, Cl. 514-307.000.
Cho, Ko D.: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,613,491, Cl. 423-347.000.
Choay, Patrick; Roger, Pierre; and Olliero, Dominique, to Choay S.A. Method for treating disorders of lipid metabolism using benzene sulfonamides. 4,613,618, Cl. 514-538.000.
Choay S.A.: *See*—
Choay, Patrick; Roger, Pierre; and Olliero, Dominique, 4,613,618, Cl. 514-538.000.
Choi, Frank H.; Rein, Samuel W.; and Alexander, David L., to Texaco Inc. Method and apparatus for measuring viscosity. 4,612,799, Cl. 73-54.000.
Chow, Robert Y.: *See*—
Hough, Jack V. D.; Richard, Gordon L.; Barton, Kenneth E., Jr.; DiCarlo, Paul; and Chow, Robert Y., 4,612,915, Cl. 128-1.00R.
Christ, Hubertus; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Compound glass pane construction and method for heating the same. 4,613,073, Cl. 237-12.30R.
Christel, Conrad, Jr., to Pall Corporation. Electromagnetic detector for metallic materials having an improved phase detection circuit. 4,613,815, Cl. 324-233.000.
Christy, Lawrence. Method of restoring marble and brick surfaces. 4,613,378, Cl. 134-2.000.
Chrysler Corporation: *See*—
Behrens, William L., 4,612,820, Cl. 74-475.000.
Chu, David C., to Hewlett-Packard Company. Time interval measuring apparatus and method. 4,613,951, Cl. 364-569.000.
Chu, Ming Y. W.: *See*—
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, 4,613,604, Cl. 514-274.000.
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, to Brown University Research Foundation. Hydroxymethyl derivatives of 5-benzylacyclouridine and 5-benzoyloxybenzylacyclouridine and their use as potentiators for 5-fluoro-2'-deoxyuridine. 4,613,604, Cl. 514-274.000.
Chubachi, Ryoji; and Nihei, Nobuyuki, to Sony Corporation. Magnetic recording medium. 4,613,545, Cl. 428-328.000.
Chui, Kui M., to Picker International Ltd. Nuclear magnetic resonance imaging apparatus. 4,613,819, Cl. 324-308.000.
Chwang, Ronald J. C., to Intel Corporation. CMOS static memory cell. 4,613,886, Cl. 357-42.000.
Ciba-Geigy Corporation: *See*—
Berendt, Hans-Ulrich; and Schafer, Paul, 4,613,335, Cl. 8-477.000.
Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., 4,613,669, Cl. 546-167.000.
Fuhrer, Walter; Buhlmayer, Peter; Rasetti, Vittorio; and Riniker, Bernhard, 4,613,676, Cl. 560-39.000.
Goschke, Richard, 4,613,599, Cl. 514-234.000.
Kopf, Helmut; and Bucher, Christian, 4,613,496, Cl. 424-14.000.
Ciba-Giegy AG: *See*—
Cherry, Peter J.; and Freeman, Barrie A., 4,613,223, Cl. 354-322.000.
Cibulka, Frank; and Stacey, Eric J., to Westinghouse Electric Corp. Method and circuit for reduction of stress in thyristors operating in the individual emergency firing mode. 4,613,932, Cl. 363-54.000.
Ciftan, Mikael: *See*—
Tegrarian, Haig V.; and Ciftan, Mikael, 4,613,327, Cl. 604-141.000.
Cimber, Hugo. Intrauterine contraceptive device. 4,612,924, Cl. 128-130.000.
Cincinnati Incorporated: *See*—
Smyth, Dale C., Jr., 4,612,796, Cl. 72-481.000.
Cincinnati Microwave, Inc.: *See*—
Fende, John R.; Furnish, Gregory R.; and Grimsley, Richard L., 4,613,989, Cl. 455-351.000.
CISE-Centro Informazioni Studi Esperienze S.p.A.: *See*—
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, 4,613,206, Cl. 350-174.000.
Cit-Alcatel Compagnie Industrielle des Telecommunications: *See*—
Paquet, Jean-Marc; and Sibuet, Rene , 4,613,111, Cl. 251-46.000.
Clark, John K.: *See*—
Sleigh, Thomas; Savage, David S.; and Clark, John K., 4,613,619, Cl. 514-546.000.
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, to Syntex (U.S.A.) Inc. Tetrahydroisoquinoline derivatives. 4,613,606, Cl. 514-307.000.
Clarke, Michael R.; and Troughton, Gary E., to Forintek Canada Corp. Method and apparatus for rapidly determining the moisture content of a substance. 4,612,802, Cl. 73-73.000.
Clauson, Melvil B.: *See*—
Wagner, John R., Jr.; and Clauson, Melvil B., 4,613,547, Cl. 428-349.000.
Clegg, John E. Monochromatic beam concentrator. 4,613,213, Cl. 350-432.000.
Clemar Manufacturing Corp.: *See*—
Lobato, Toribio Q., 4,613,764, Cl. 307-116.000.
Cline, Ernest E.: *See*—
Glaze, John W., Jr.; and Cline, Ernest E., 4,613,065, Cl. 223-37.000.
Clorox Company, The: *See*—
Casella, Victor M.; and Fong, Ronald A., 4,613,332, Cl. 8-111.000.
Cockin, John: *See*—
Selberg, Roberto B. O.; Kronogard, N. Hakan; and Cockin, John, 4,613,133, Cl. 273-195.00B.
Cohen, Louis, to B. F. Goodrich Company, The. Coated polymerization vessels and methods for use thereof. 4,613,483, Cl. 422-131.000.
Colgate-Palmolive Co., The: *See*—
Cheng, Bao-Ding, 4,613,448, Cl. 252-157.000.
Collette, Robert P., to Eastman Kodak Company. Injection-locked video frequency oscillator. 4,613,828, Cl. 331-47.000.
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Hayes, Norman F., to Glaxo Group Limited. Aminocyclopentanes and their preparation and pharmaceutical formulation. 4,613,597, Cl. 514-211.000.
Colonnello, Rino, to Aero Product Europa. Apparatus for measuring fuel consumption. 4,612,804, Cl. 73-113.000.
Combustion Engineering, Inc.: *See*—
Willis, William R.; Hunter, James D.; and Lewis, Max L., 4,613,303, Cl. 431-346.000.
Commereuc, Dominique: *See*—
Chauvin, Yves; Commereuc, Dominique; Cruypelinck, Daniel; Hugues, Francois; and Vidouta, Georges, 4,613,726, Cl. 585-861.000.
Compagnie Francaise des Petroles: *See*—
Ranchet, Jean. P.; and Serval, Eric, 4,613,347, Cl. 55-53.000.
Componenti Grafici s.r.l.: *See*—
Molinatto, Bruno, 4,612,692, Cl. 29-116.0AD.
Conger, Roger C. Rotary volumetric loading meter. 4,613,058, Cl. 222-36.000.
Conner, Donald E., to Van Dyk & Company Inc. Substituted cinnamal dialkyl malonates in sunscreening, skin care compositions. 4,613,499, Cl. 424-59.000.
Connors, Arthur F. Fuel tank cap cover. 4,613,055, Cl. 220-210.000.
Conoco Inc.: *See*—
Newlin, Larry L.; and Chapman, William L., 4,613,980, Cl. 375-116.000.
Sternberg, Ben K.; and Nopper, Richard W., Jr., 4,613,821, Cl. 324-323.000.
Yoon, Heeyoung; and Statnick, Robert M., 4,613,487, Cl. 423-244.000.
Consolidated Investments and Development Corp.: *See*—
Raab, Herman P., 4,613,770, Cl. 307-350.000.

Continental Can Company, Inc.: *See*—
Walter, John; Roth, Donald J.; and Kubis, Charles S., 4,613,062, Cl. 222-146.200.

Continental Disc Corporation: *See*—
Wilson, Bryce H., 4,612,739, Cl. 52-1.000.

Control Data Corporation: *See*—
Lurie, Oscar M., 4,613,904, Cl. 358-142.000.

Control Devices, Incorporated: *See*—
Purvis, Michael J., 4,612,962, Cl. 137-543.170.

Conversion Systems, Inc.: *See*—
Smith, Charles L., 4,613,374, Cl. 106-118.000.

Cook, Roy D.: *See*—
Gretsch, Fred W.; Cook, Roy D.; and Iler, Bobby C., 4,612,840, Cl. 84-269.000.

Cooke, Elizabeth E.: *See*—
Cooke, George, 4,612,879, Cl. 122-235.00F.

Cooke, George, to Cooke, Elizabeth E. Hot water heater and steam generator. 4,612,879, Cl. 122-235.00F.

Cooney, James S., to Pylon Company, Inc. Production of metal-plated areas on selected interior portions of deep-drawn tubular parts. 4,612,703, Cl. 29-885.000.

Cooper, Ashley G.: *See*—
McKirdy, Bruce J.; and Cooper, Ashley G., 4,612,808, Cl. 73-622.000.

Cooper Industries, Inc.: *See*—
Suher, Frank; Dunn, Glen; Spaunhorst, Vernon; and Urani, Angelo, 4,613,195, Cl. 339-31.00R.

Cooper, Roderick A., to Warrington Inc. Toe binding for skis. 4,613,150, Cl. 280-615.000.

Coquerel, Claude, to Equipement Industriel Normand. Safety hole forming a gaseous product preventive siphon. 4,612,956, Cl. 137-386.000.

Corbin, David R.: *See*—
Bonifaz, Cristobal; Corbin, David R.; and Parise, John B., 4,613,720, Cl. 585-640.000.

Corcoran, Daniel P. Junction coupling with unitary locking gasket and methods for their use. 4,613,171, Cl. 285-197.000.

Cordis Corporation: *See*—
Batty, John R., Jr., 4,613,937, Cl. 364-413.000.

Corren, Dean R.; and Miller, Gabriel, to Riverside Energy Technology, Inc. Kinetic hydro energy conversion system. 4,613,279, Cl. 415-2.00A.

Corry, Robert G.: *See*—
Swan, George A.; Baird, William C., Jr.; and Corry, Robert G., 4,613,423, Cl. 208-65.000.

Cosden Technology, Inc.: *See*—
MacLaughlin, Donald N., 4,613,746, Cl. 219-490.000.

Costello, Walter H., to Mobil Oil Corporation. Valveless shut-off and transfer device. 4,612,959, Cl. 137-828.000.

Cot, Louis: *See*—
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, 4,613,450, Cl. 252-181.000.

Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., to Sloan-Kettering Institute for Cancer Research. Human monoclonal antibodies to cancer cells. 4,613,576, Cl. 436-548.000.

Couleur, John F. Method and apparatus for pipe line processing with a single arithmetic logic unit. 4,613,935, Cl. 364-200.000.

Cox, Eugene R., to Harris Corporation. Method to reduce the height of the bird's head in oxide isolated processes. 4,612,701, Cl. 29-576.00W.

CPC International Inc.: *See*—
Zeman, Nancy W., 4,613,570, Cl. 435-99.000.

Crane Co.: *See*—
Johnson, Stuart E., 4,613,190, Cl. 303-109.000.

Crankshaft Machine Company: *See*—
Baker, Gary L., 4,612,690, Cl. 29-33.00P.

Crawford, James B. Apparatus for the running and pulling of wire-line tools and the like in an oil or gas well. 4,612,984, Cl. 166-77.000.

Creighton, Kenneth R.: *See*—
De Leeuw, William L.; and Creighton, Kenneth R., 4,612,823, Cl. 74-533.000.

Cribbs, Robert W.; and Zanelli, Claudio I., to Sound Products Company, L.P. Curved-array ultrasonic probe using low-velocity fluid. 4,612,809, Cl. 73-626.000.

Crosby, Frank. Hemorrhoid medication. 4,613,498, Cl. 424-154.000.

Crosfield Electronics (USA) Limited: *See*—
Stansfield, Peter W., 4,613,897, Cl. 358-80.000.

Cross, Paul C.: *See*—
Hansen, Craig N.; and Cross, Paul C., 4,612,886, Cl. 123-190.00B.

Crossett, Edward H. Convertible sofa mechanism. 4,612,677, Cl. 5-12.00R.

Croudace, Michael C.: *See*—
Brass, Stephen; Croudace, Michael C.; and Wusz, Timothy, 4,612,880, Cl. 123-1.00A.

Crouse, William G.; Cunningham, Earl A.; and Vinal, Albert W., to International Business Machines Corporation. Twin track vertical magnetic recording servo control method and apparatus with offset voltage compensation. 4,613,915, Cl. 360-77.000.

Crucible Materials Corporation: *See*—
Eckenrod, John J.; Pinnow, Kenneth E.; Rhodes, Geoffrey O.; and Royer, William E., 4,613,367, Cl. 420-42.000.

Cruickshank, John S., to LBP Partnership. Profile imaging techniques. 4,613,234, Cl. 356-394.000.

Cruypelinck, Daniel: *See*—
Chauvin, Yves; Commereuc, Dominique; Cruypelinck, Daniel; Hugues, Francois; and Vidouta, Georges, 4,613,726, Cl. 585-861.000.

Csutak, Janos: *See*—
Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, 4,613,615, Cl. 514-478.000.

Culican, Edward F.; Graf, Matthew C.; and Ritchie, Leonard C., to International Business Machines Corporation. Gate array chip. 4,613,958, Cl. 365-189.000.

Cunningham, Earl A.: *See*—
Crouse, William G.; Cunningham, Earl A.; and Vinal, Albert W., 4,613,915, Cl. 360-77.000.

Currie, Robert J.; Rushforth, Craig K.; and Zscheile, John W., Jr., to Sperry Corporation. Coder-decoder for purged binary block codes. 4,613,860, Cl. 340-825.570.

Curtis, Hazen, III, to AT&T Bell Laboratories. Electronic oscillator crystal wafer mount assembly. 4,613,783, Cl. 310-353.000.

Cutchaw, John M. Apparatus for cooling high-density integrated circuit packages. 4,612,978, Cl. 165-104.330.

Cuzin, Marc: *See*—
Capdeboscq, Bernard; and Cuzin, Marc, 4,613,268, Cl. 414-114.000.

Cwirzen, Casimir; and Jaycox, Donald F., to Northern Telecom Limited. Interface module with modular jack for telecommunications systems. 4,613,732, Cl. 179-178.000.

D. Klein & Son, Inc.: *See*—
Shaw, Anthony; and Zuckerbrod, Jesse, 4,613,039, Cl. 206-287.100.

Dabi, Shmuel, to Personal Products Company. Interpenetrating polymeric network foams comprising crosslinked polyelectrolytes. 4,613,543, Cl. 428-304.400.

Dableh, Joseph H. Method of repositioning annular spacers in calandria structures and apparatus therefor. 4,613,477, Cl. 376-258.000.

Dabosi, Francis: *See*—
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, 4,613,450, Cl. 252-181.000.

Dabrowski, Andrzej J.: *See*—
Iwanczyk, Jan S.; Barton, Jeff B.; Dabrowski, Andrzej J.; and Schneppie, Wayne F., 4,613,756, Cl. 250-361.00R.

Dahl, Warren J., to Eaton-Kenway, Inc. Digital data decoder and method. 4,613,973, Cl. 375-37.000.

Dahod, Samun K., to Stauffer Chemical Company. Racemization of optically active compounds having a bromine substituted chiral carbon atom. 4,613,690, Cl. 562-401.000.

Dahod, Samun K.: *See*—
Siuta-Mangano, Patricia; and Dahod, Samun K., 4,613,689, Cl. 562-401.000.

Daicel Chemical Industries, Ltd.: *See*—
Yuki, Heimei; and Okamoto, Yoshio, 4,613,442, Cl. 252-1.000.

Daiguji, Hisashi, to Harumoto Iron Works Co., Ltd. Cover joint and armor for bridge cable. 4,612,680, Cl. 14-22.000.

Daimler-Benz Aktiengesellschaft: *See*—
Christ, Hubertus; and Wulf, Helmut, 4,613,073, Cl. 237-12.30R.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Takita, Nobuhiro; Shimamoto, Yosuke; Tada, Hiroichi; and Tamura, Yutaka, 4,613,896, Cl. 358-76.000.

Daisenberger, Georg, to Siemens Aktiengesellschaft. Telecommunications system, particularly a telephone exchange system having overload-protected sequential logic systems. 4,613,729, Cl. 179-8.00A.

Dale Electronics, Inc.: *See*—
Person, Herman R.; Hesse, Joseph F.; and Raysby, Keith T., 4,613,855, Cl. 340-718.000.

Dambre, Paul: *See*—
De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, 4,612,792, Cl. 72-183.000.

Dana-Farber Cancer Institute: *See*—
Cantor, Harvey I.; and Nabel, Gary, 4,613,459, Cl. 530-351.000.

Daniels, John Y.: *See*—
Hendrix, James E.; Daniels, John Y.; and White, Taryn M., 4,613,333, Cl. 8-115.700.

Dantzig, Jonathan A., to Olin Corporation. Method and apparatus for electro-magnetic casting of complex shapes. 4,612,972, Cl. 164-465.000.

Dasgupta, Sunil P., to Hercules Incorporated. Coating compositions. 4,613,520, Cl. 427-128.000.

Data Recording Systems, Inc.: *See*—
Spencer, David R.; Goldstein, Amnon; Grey, David; Balchunas, Theodore G.; and Kaplan, Arthur B., 4,613,877, Cl. 346-160.000.

Davco Manufacturing Corporation: *See*—
Davis, Leland L., 4,612,897, Cl. 123-557.000.

Davidson, Dale D.; and Dietz, David A., to Sperry Corporation. Error isolator for bi-directional communications buses. 4,613,858, Cl. 340-825.500.

Davis, Charles M., to Optical Technologies, Inc. Fiber optic force measuring device. 4,613,752, Cl. 250-227.000.

Davis, Leland L., to Davco Manufacturing Corporation. Heated fuel delivery system fitting and method. 4,612,897, Cl. 123-557.000.

DE.BI Derivati Biologici International S.p.A.: *See*—
Casati, Paolo; Elefante, Biagio; and Fuganti, Claudio, 4,613,460, Cl. 560-41.000.

Deal, Philip A., to R. J. Reynolds Tobacco Company. Carton flap folding assembly for cigarette cartons. 4,612,752, Cl. 53-377.000.

Deavenport, Joe E.: *See*—
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,613,847, Cl. 340-114.00R.

De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, to N. V. Bekaert S. A. Method of manufacturing fatigue resistant cables. 4,612,792, Cl. 72-183.000.

Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., to Labofina, S.A. Process for removing carbonyl-sulfide from liquid hydrocarbon feedstocks. 4,613,724, Cl. 585-824.000.

De Clippeleir, Georges E. M. J.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,613,724, Cl. 585-824.000.

Deem, Brian C.; and Ott, William E., to Allied Corporation. Brake slack adjuster. 4,613,020, Cl. 180-196.00M.

Deere & Company: *See*—
Benedek, Vasile; Huckler, Volker; and Ortlepp, Hilmar S., 4,612,995, Cl. 172-7.000.
Kunde, Detlev, 4,612,941, Cl. 130-27.00R.
Olson, Jay H., 4,613,056, Cl. 221-211.000.

DeGraffenreid, Howard T. Triangular filter cartridge and apparatus. 4,613,438, Cl. 210-323.100.

Deha Baubedarf GmbH & Co. KG: *See*—
Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, 4,612,747, Cl. 52-250.000.

Dehming, Zhou, to Institute of Zoology Academia Sinica. Novel gel electrophoresis cell having a lower buffer chamber with perforated shoulder for holding gel tubes or channels. 4,613,419, Cl. 204-299.00R.

Deisler, Richard J.; and Goldberg, Eugene P., to Medical Research Associates, Ltd. #2. Transparent thermoplastic elastomeric compositions and articles produced therefrom. 4,613,640, Cl. 524-264.000.

de Jong, Hendrik J., to N.V. Nederlandsche Apparatenfabriek NEDAP. Holder for electronic detection element, comprising band attachment with pull force protection. 4,612,719, Cl. 40-21.00R.

Delattre, Luc; Moulin, Jean-Francois; and Badin, Suzan, to Essilor International Cie Generale d'Optique. Machine for grinding ophthalmic lenses. 4,612,732, Cl. 51-101.01LG.

De Leeuw, William L.; and Creighton, Kenneth R., to Wickes Manufacturing Company. Vehicle parking brake mechanism. 4,612,823, Cl. 74-533.000.

Deluca, Domenico: *See*—
Longi, Paolo; Giannini, Umberto; Mazzocchi, Romano; and Deluca, Domenico, 4,613,655, Cl. 526-114.000.

Delzer, Gary A.: *See*—
Kolts, John H.; and Delzer, Gary A., 4,613,722, Cl. 585-651.000.

DenBeste, Steven C.: *See*—
Olin, Daniel C.; Anderson, Russell Y.; and DenBeste, Steven C., 4,613,856, Cl. 340-723.000.

Deserno, Ulrich; and Schmidt, Gunther, to Siemens Aktiengesellschaft. Method for visualizing a doped structure in undoped environment. 4,613,757, Cl. 250-458.100.

Design & Manufacturing Corporation: *See*—
Duncan, Thomas W., 4,612,947, Cl. 134-104.000.

Desogus, Fabio. Water-storage reservoir. 4,612,951, Cl. 137-209.000.

Despres, Dominique, to Valeo. Friction clutch mechanism with improved travel limiting device. 4,613,025, Cl. 192-70.180.

Dettmers, Michael: *See*—
Weirich, Walter; and Dettmers, Michael, 4,613,257, Cl. 405-302.000.

Deutsche Prazisions-Ventil GmbH: *See*—
Meuresch, Herbert; and Fuhrig, Wolfgang, 4,613,061, Cl. 222-82.000.

de Wild, Willem R.; de With, Gijsbertus; and Smulders, Henricus C., to U.S. Philips Corporation. Method of manufacturing multilayer capacitors. 4,612,689, Cl. 29-25.420.

Dewing, Ernest W.; Gesing, Adam J.; Mitchell, David N.; and Pant, Aniket, to Alcan International Limited. Aluminium reduction cells. 4,613,418, Cl. 204-243.00R.

de With, Gijsbertus: *See*—
de Wild, Willem R.; de With, Gijsbertus; and Smulders, Henricus C., 4,612,689, Cl. 29-25.420.

D'Haene, Urbain: *See*—
De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, 4,612,792, Cl. 72-183.000.

Diamond, Julius; Lumma, William C., Jr.; Morgan, Thomas K., Jr.; and Wohl, Ronald A., to Schering A. G. Antiarrhythmic imidazoliums. 4,613,609, Cl. 514-396.000.

DiCarlo, Paul: *See*—
Hough, Jack V. D.; Richard, Gordon L.; Barton, Kenneth E., Jr.; DiCarlo, Paul; and Chow, Robert Y., 4,612,915, Cl. 128-1.00R.

Dick, Carroll J., to International Business Machines Corporation. Apparatus or method for stabilizing the frequency of a clock signal generated from an on-chip clock generator. 4,613,775, Cl. 307-480.000.

Didier-Werke AG: *See*—
Palz, Helmut; and Kainer, Hartmut, 4,612,981, Cl. 165-158.000.

Diebold, Incorporated: *See*—
Beck, Robert J.; and Richardson, Jack, 4,612,864, Cl. 109-49.500.

Diemer, Bruce R.: *See*—
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., 4,613,345, Cl. 51-293.000.

Diener, Jorg; and Zobel, Jurgen, to Richard Wolf GmbH. Measuring device for testing optical systems of an endoscope. 4,613,232, Cl. 356-124.000.

Dienes nee, Erzsebet, Mezo: *See*—
Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, 4,613,615, Cl. 514-478.000.

Diesel Kiki Co., Ltd.: *See*—
Ishibashi, Toru; and Taira, Shigeo, 4,612,893, Cl. 123-447.000.
Ohnishi, Masanori, 4,612,890, Cl. 123-373.000.

Dietlein, John E.: *See*—
Bauman, Therese M.; and Dietlein, John E., 4,613,630, Cl. 521-134.000.

Dietrich, Ralph; Jocham, Dieter; Unsold, Eberhard; Weinsheimer, Wolfram; and Gorisch, Wolfram, to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen. Method for illuminating cavities. 4,612,938, Cl. 128-665.000.

Dietrich, Werner; and Kinzel, Richard, to Motoren-Werke Mannheim AG, vorm. Benz Stat. Motorenba. Fuel injection apparatus. 4,612,905, Cl. 123-575.000.

Dietz, David A.: *See*—
Davidson, Dale D.; and Dietz, David A., 4,613,858, Cl. 340-825.500.

Dietz, Peter W.; and Miller, Russell S., to General Electric Company. Apparatus and method for forming fine liquid metal droplets. 4,613,076, Cl. 239-3.000.

Dietze, Herbert: *See*—
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, 4,613,095, Cl. 242-198.000.

Dingess, John A., to Safety-Kleen Corporation. Compositions for cleaning aluminum. 4,613,449, Cl. 252-174.170.

Dinkelmann, Friedrich: *See*—
Wolf, Horst; and Dinkelmann, Friedrich, 4,612,760, Cl. 57-105.000.

Director, Fruit Tree Research Foundation: *See*—
Yamazaki, Toshihiko; Murase, Shoji; Suzuki, Katsuyuki; and Iwatsuki, Makoto, 4,613,359, Cl. 71-122.000.

Di Stefano, Thomas H.; and Sadofsky, Robert, to International Business Machines Corporation. Sealed encapsulation for floppy disk using centrifugal force to flatten disk. 4,613,966, Cl. 369-100.000.

Dobberstein, Robert H.; and Suzuki, Fred K., to Stevia Company, Inc. Flavor enhancing and modifying materials. 4,612,942, Cl. 131-276.000.

Dr. Ing. h.c.F. Porsche A.G.: *See*—
Rispeter, Siegfried; and Schneider, Diethelm, 4,613,184, Cl. 296-187.000.

Doddapaneni, Narayan, to Honeywell Inc. High rate metal oxyhalide cells. 4,613,551, Cl. 429-194.000.

Dogey, Kent A. Portable collapsible solar survival apparatus. 4,612,914, Cl. 126-438.000.

Doltron AG: *See*—
Rechsteiner, Alfred, 4,612,813, Cl. 73-861.250.

Donati, Gino. Procedure and relevant mechanical apparatus to obtain the folding section of a plastic drinking straw. 4,613,474, Cl. 264-320.000.

Doorakian, George A.: *See*—
Langer, Horst G.; Brady, Thomas P.; Paul, Marsha A.; and Doorakian, George A., 4,613,661, Cl. 528-108.000.

Dorer, Casper J., Jr.; and Hayashi, Katsumi, to Lubrizol Corporation, The. Hydrocarbyl substituted carboxylic acylating agent derivative containing combinations, and fuels containing same. 4,613,342, Cl. 44-62.000.

Dormia, Enrico, to Societe Anonyme: Synthelabo. Instrument for extracting foreign bodies from physiological canals or ducts in the human body. 4,612,931, Cl. 128-328.000.

Dornheim, Hans-Peter; and Saffer, Edmund, to Siemens Aktiengesellschaft. Radiodiagnostic apparatus for mammograms. 4,613,982, Cl. 378-37.000.

Doura, Fumihiro: *See*—
Nakayama, Takeo; Fujinami, Kimiya; Sakamoto, Takurou; and Doura, Fumihiro, 4,613,652, Cl. 525-276.000.

Doveri, Carlo, to Piaggio & C. S.p.A. Feeding governor of a diesel cycle engine in the starting stage. 4,612,891, Cl. 123-373.000.

Dow Chemical Company, The: *See*—
Eickholt, Kathryn A., 4,613,682, Cl. 560-61.000.
Grosshandler, Sandor, 4,613,163, Cl. 285-27.000.
Hefner, Robert E., Jr., 4,613,703, Cl. 568-640.000.
Kitchens, John D.; and Novak, Leo R., 4,613,653, Cl. 525-352.000.
Lane, George A.; and Rossow, Harold E., 4,613,444, Cl. 252-70.000.
Langer, Horst G.; Brady, Thomas P.; Paul, Marsha A.; and Doorakian, George A., 4,613,661, Cl. 528-108.000.
Relenyi, Attila G.; Wallick, David E.; and Streit, Jill D., 4,613,671, Cl. 549-274.000.
Swart, Daniel J., 4,613,678, Cl. 560-92.000.
Treybig, Duane S., 4,613,663, Cl. 528-266.000.
Walles, Wilhelm E., 4,613,524, Cl. 427-243.000.
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,613,503, Cl. 424-117.000.
Yates, Ronald L.; and Hagans, Patrick L., 4,613,386, Cl. 148-13.000.

Dow Corning Corporation: *See*—
Bauman, Therese M.; and Dietlein, John E., 4,613,630, Cl. 521-134.000.
Blizzard, John D.; and VanWert, Bernard, 4,613,534, Cl. 428-57.000.
Chen, Jie, 4,613,380, Cl. 134-30.000.
Lee, Chi-long; and Maxson, Myron T., 4,613,659, Cl. 528-15.000.

Dowell Schlumberger Incorporated: *See*—
Campman, Keith S., 4,612,814, Cl. 73-861.720.

Draayer, Johannes, to GTE Communication Systems Corporation. Method for controlling a multistage space switching network. 4,613,969, Cl. 370-58.000.
Drabish, Steve, to Drabish, Steve; and Johnston, Roger A. Reusable greeting card. 4,613,157, Cl. 283-1.00R.
Draft Systems, Inc.: *See*—
Fallon, Merton R., 4,612,952, Cl. 137-212.000.
Dragerwerk AG: *See*—
Schubert, Ernst W.; and Gebhardt, Peter, 4,612,929, Cl. 128-204.250.
Dragerwerk Aktiengesellschaft: *See*—
Westrup, Bernhard; and Marcoll, Joachim, 4,613,575, Cl. 436-106.000.
Drapp, Donald J.; and Cabler, Paul S., to Mini Base Systems, Inc. Fluid separator and flow stabilization structure. 4,613,349, Cl. 55-458.000.
Drechsler, Klaus D.; Heuer, Werner; and Tiebel, Rainer, to Polygram GmbH. Conveyor system for disc magazine having an identifier disc. 4,613,751, Cl. 250-223.00R.
Dreyer, Juergen: *See*—
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, 4,613,095, Cl. 242-198.000.
Driver, John A., to Plant Research Laboratories. Method for acclimatizing and propagating plant tissue culture shoots. 4,612,725, Cl. 47-58.000.
Du Bois, Donald E. Apparatus for preventing operation of machinery by one who is intoxicated. 4,613,845, Cl. 340-52.00R.
Duchane, David V.; and Cash, David L., to United States of America, Energy. Method of forming a foamed thermoplastic polymer. 4,613,629, Cl. 521-82.000.
Dueber, Thomas E.; Scheiber, David H.; and Simmons, Howard E., III, to Du Pont de Nemours, E. I., and Company. Photosensitive ceramic coating composition. 4,613,560, Cl. 430-286.000.
Duffy, John W.: *See*—
Ham, Mooyoung; and Duffy, John W., 4,613,518, Cl. 427-38.000.
Duncan, Thomas W., to Design & Manufacturing Corporation. Apparatus for removing soil from the wash and rinse waters of an automatic dishwasher. 4,612,947, Cl. 134-104.000.
Dunn, Glen: *See*—
Suher, Frank; Dunn, Glen; Spaunhorst, Vernon; and Urani, Angelo, 4,613,195, Cl. 339-31.00R.
Dunn, Terry S.: *See*—
Williams, Joel L.; Dunn, Terry S.; O'Connell, James P.; and Montgomery, David, 4,613,517, Cl. 427-2.000.
Dunson, Philip M.: *See*—
Verber, Carl M.; Smith, Thomas B.; and Dunson, Philip M., 4,613,204, Cl. 350-96.140.
Du Pont de Nemours, E. I., and Company: *See*—
Aikens, Paul W., 4,612,691, Cl. 29-33.00R.
Bonifaz, Cristobal; Corbin, David R.; and Parise, John B., 4,613,720, Cl. 585-640.000.
Dueber, Thomas E.; Scheiber, David H.; and Simmons, Howard E., III, 4,613,560, Cl. 430-286.000.
Fisher, Ronald T.; Fisher, Paul J.; and Spain, David P., 4,613,984, Cl. 378-185.000.
Hormadaly, Jacob, 4,613,539, Cl. 428-210.000.
Loomis, Gary L.; and Statz, Robert J., 4,613,533, Cl. 428-36.000.
Lovendusky, Charles M.; and White, Gregory G., 4,612,699, Cl. 29-739.000.
Miller, Donald F., 4,612,842, Cl. 83-24.000.
Ojakaar, Leo, 4,613,636, Cl. 524-83.000.
Papa, Ralph A., 4,613,191, Cl. 339-14.00R.
Usala, Hugo R., 4,613,648, Cl. 524-555.000.
Duprat, Michel: *See*—
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, 4,613,450, Cl. 252-181.000.
Dur-O-Wal, Inc.: *See*—
Gloppen, Edward C.; and Scott, Norman L., 4,612,751, Cl. 52-723.000.
Durand, Jean: *See*—
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, 4,613,450, Cl. 252-181.000.
Durant, Jacques: *See*—
Marcon, Joel; Durant, Jacques; Simon, Georges; and Boisseau, Alain, 4,612,843, Cl. 89-33.040.
Durant, Will G., to Westmont, Inc. Combined auger and air-type valve bag filling machine. 4,612,964, Cl. 141-68.000.
Durst, Fred C., Jr. : *See*—
Bowers, Thomas, 4,612,686, Cl. 24-71.100.
Dwight Cavendish Co., Ltd.: *See*—
Shortle, Martin C.; and Lobb, Daniel R., 4,613,201, Cl. 350-6.100.
Dwyer, Arthur S.: *See*—
Kasevich, Raymond S.; Dwyer, Arthur S.; and Guerreri, Bart G., 4,612,940, Cl. 128-804.000.
Dzewaltowski, Victor F.: *See*—
Millay, Lawrence I.; and Dzewaltowski, Victor F., 4,612,735, Cl. 51-217.00R.
Eagle Electric Mfg. Co., Inc.: *See*—
Munroe, Ronald G.; and Moreinis, Gregory E., 4,613,197, Cl. 339-99.00R.
Eastman Kodak Company: *See*—
Burkey, Bruce C.; VanHeyningen, Roger S.; Spaulding, Richard A.; and Wolf, Edward L., 4,613,895, Cl. 358-41.000.
Collette, Robert P., 4,613,828, Cl. 331-47.000.
Katerberg, James A., 4,613,871, Cl. 346-1.100.
Losee, David L.; and Lavine, James P., 4,613,402, Cl. 156-643.000.
Mainord, Kenneth R., 4,613,679, Cl. 560-190.000.
Eaton Corporation: *See*—
Bernstrom, Marvin L.; and Zumbusch, Steven J., 4,613,292, Cl. 418-61.00B.
Eaton-Kenway, Inc.: *See*—
Dahl, Warren J., 4,613,973, Cl. 375-37.000.
Swenson, Ronald R., 4,613,804, Cl. 318-587.000.
Eaton, Steven G.: *See*—
Siddall, Graham J.; Eaton, Steven G.; Kruger, James B.; Garrettson, Garrett A.; and Neukermans, Armand P., 4,613,981, Cl. 378-34.000.
Eberle, Gunter, to Andreas Hettich, Firma. Centrifuge chamber for cytodiagnostic investigation of epithelial cells contained in a sample. 4,612,873, Cl. 118-52.000.
Ebisawa, Mikio: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,613,467, Cl. 260-543.00F.
Eckel, Merowech, to U.S. Philips Corporation. Grinding machine. 4,612,731, Cl. 51-56.00R.
Eckenrod, John J.; Pinnow, Kenneth E.; Rhodes, Geoffrey O.; and Royer, William E., to Crucible Materials Corporation. Low carbon plus nitrogen, free-machining austenitic stainless steel. 4,613,367, Cl. 420-42.000.
Ecker, Walter: *See*—
Berg, Robin L.; Morrissette, Douglas; and Ecker, Walter, 4,613,174, Cl. 292-136.000.
Eckert, Guenther; and Singer, Franz, to Siemens Aktiengesellschaft. Resilient clamping device for securing an arc chute cover of a switching device. 4,613,734, Cl. 200-144.00R.
Edberg, Nils; Kores, Ivar; Holmkvist, Gottfrid; and Helmerson, Rickard, to Gotaverken Arendal AB. Weather protected offshore drilling rig. 4,613,001, Cl. 175-52.000.
Edelson, Richard L. Method and system for externally treating the blood. 4,613,322, Cl. 604-6.000.
Edelstein, William A.; Eisner, David R.; Redington, Rowland W.; and Smith, Lowell S., to General Electric Company. RF shielded room for NMR imaging system. 4,613,820, Cl. 324-318.000.
Eder, Wolf-Dieter, to MTU. Apparatus for compensating for variations in pressure and flow in fuel supply systems of gas turbine engines. 4,612,766, Cl. 60-261.000.
Edison, Robert R., to Katalistiks, Inc. Hydrocarbon cracking process. 4,613,428, Cl. 208-113.000.
Edouard Dubied & Cie. S.A.: *See*—
Perotti, Andre , 4,612,786, Cl. 66-121.000.
Edwards, Arthur J., to Motorola, Inc. Fault detector for an alternator. 4,613,808, Cl. 322-99.000.
Edwards, Floyd V.; and Boehmer, Dennis A., to Vernay Laboratories, Inc. Valve assembly. 4,612,960, Cl. 137-846.000.
Eggers, Frederick W.; Graham, Paul D.; and Heeb, Bruce E., to Federal Signal Corporation. Flash strobe power supply. 4,613,797, Cl. 315-241.00R.
Eguchi, Yasuteru: *See*—
Hara, Kenji; and Eguchi, Yasuteru, 4,613,447, Cl. 252-91.000.
Ehrl, Peter A., to Feldmuhle Aktiengesellschaft. Jaw implant having an aperture to receive a replacement-tooth holder. 4,613,308, Cl. 433-173.000.
Eickholt, Kathryn A., to Dow Chemical Company, The. Ether synthesis. 4,613,682, Cl. 560-61.000.
Eickmann, Karl. Devices which may be borne in air and on devices applicable therein. 4,613,098, Cl. 244-46.000.
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, to Kvaerner Brug A/S; and Ingenior F. Selmar A/S. Method for the building of sea wave power plants. 4,613,252, Cl. 405-76.000.
Eisai Co., Ltd.: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.
Eisenkolb, Klaus; Plochberger, Franz; and Puhringer, Johann, to Voest-Alpine Aktiengesellschaft. Apparatus for removing bulk material from a dump. 4,613,035, Cl. 198-509.000.
Eisner, David R.: *See*—
Edelstein, William A.; Eisner, David R.; Redington, Rowland W.; and Smith, Lowell S., 4,613,820, Cl. 324-318.000.
Ekman, Kjell R. Arrangement for a coupling with a first and a second coupling part and a method for production of the coupling. 4,613,158, Cl. 285-3.000.
Elefante, Biagio: *See*—
Casati, Paolo; Elefante, Biagio; and Fuganti, Claudio, 4,613,460, Cl. 560-41.000.
Eli Lilly and Company: *See*—
Cannon, William N., 4,613,620, Cl. 514-570.000.
el Kouni, Mahmoud H.: *See*—
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, 4,613,604, Cl. 514-274.000.
Elliott, Keith D.: *See*—
Bellamy, John S.; and Elliott, Keith D., 4,613,251, Cl. 403-135.000.
Ellis, Paul E., Jr.: *See*—
Hsu, Chao-Yang; and Ellis, Paul E., Jr., 4,613,411, Cl. 203-67.000.
Elscint, Ltd.: *See*—
Blass, Judd; and Keren, Hanan, 4,613,837, Cl. 333-219.000.
Eltro GmbH: *See*—
Wichmann, Guenter, 4,613,231, Cl. 356-5.000.
Emch, Schaffer, Schaub & Porcello Co.: *See*—
Bowers, Thomas, 4,612,686, Cl. 24-71.100.

Emerson Electric Co.: *See—*
Hayes, Robert J.; and Mahl, Ronald M., 4,613,260, Cl. 408-74.000.
Mertz, Denny W., 4,612,783, Cl. 62-528.000.

Emhart Industries, Inc.: *See—*
Voisine, Gary R., 4,613,353, Cl. 65-163.000.

Empie, Mark W.: *See—*
Mirviss, Stanley B.; and Empie, Mark W., 4,613,691, Cl. 562-443.000.

Endo, Hirohide: *See—*
Okada, Kunihiro; Endo, Hirohide; and Saito, Susumu, 4,613,753, Cl. 250-236.000.

Engelhart, Jack, to Quality Pool Supply Co. Spa fitting sealing system. 4,613,169, Cl. 285-161.000.

Engineering, Ltd.: *See—*
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.

Engineering Patents & Equipment Limited: *See—*
Martin, John S., 4,613,100, Cl. 244-122.0AD.

Engle, James L., to Auburn Gear. End cap limited slip differential. 4,612,825, Cl. 74-711.000.

English Electric Company Limited, The: *See—*
Law, Hilton, 4,613,760, Cl. 290-1.00C.

English Electric Valve Company Limited: *See—*
Holland, David G.; and Banks, Peter B., 4,613,786, Cl. 313-528.000.

Engquist, Karl R.; and Klintworth, Keith K., to Caterpillar Inc. Exhaust manifold shield. 4,612,767, Cl. 60-321.000.

Enocson, Ake. Power transmission system for a bicycle. 4,613,010, Cl. 280-260.000.

Equipement Industriel Normand: *See—*
Coquerel, Claude, 4,612,956, Cl. 137-386.000.

Erdlen, Erwin: *See—*
Koch, Christian; and Erdlen, Erwin, 4,613,583, Cl. 502-252.000.

Erian, Fadel F., to Shell Mining Company. Slurry viscometer. 4,612,800, Cl. 73-54.000.

Eriksson, Lars. Windows. 4,612,727, Cl. 49-62.000.

Esai Co., Ltd.: *See—*
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.

Espenscheid, Loretta, executor: *See—*
Espenscheid, Wilton F., deceased; and Paul, James M., 4,613,631, Cl. 523-130.000.

Espenscheid, Wilton F., deceased (by Espenscheid, Loretta, executor); and Paul, James M., to Mobil Oil Corporation. Crosslinked polymers for enhanced oil recovery. 4,613,631, Cl. 523-130.000.

Esper, Michael J.; Haeberle, Russell J.; and Winegar, Brian G., to Ford Motor Company. Planar coil magnetic transducer. 4,613,843, Cl. 336-232.000.

Espiritu, Hermenegildo A.: *See—*
Selvin, Gerald J.; and Espiritu, Hermenegildo A., 4,613,198, Cl. 339-141.000.

Essex Industries, Inc.: *See—*
Phlipot, James R.; and Scharfenberg, Randolph E., 4,613,112, Cl. 251-149.600.

Essilor International Cie Generale d'Optique: *See—*
Delattre, Luc; Moulin, Jean-Francois; and Badin, Suzan, 4,612,732, Cl. 51-101.0LG.
Massard, Christian; Pierre, Alain; and Roumegoux, Jean-Louis, 4,612,736, Cl. 51-284.00E.

Essinger, Walter F.: *See—*
Panicker, Ramachandra M. P.; and Essinger, Walter F., 4,613,793, Cl. 315-169.300.

Etak, Inc.: *See—*
Phillips, Alan C., 4,613,913, Cl. 360-51.000.

Etat Francais: *See—*
Marcon, Joel; Durant, Jacques; Simon, Georges; and Boisseau, Alain, 4,612,843, Cl. 89-33.040.

Ethicon, Inc.: *See—*
Kronenthal, Richard L., 4,612,923, Cl. 128-92.00R.

Ethyl Corporation: *See—*
Burton, Lester P. J., 4,613,642, Cl. 524-349.000.
Hargis, Duane C., 4,613,705, Cl. 564-409.000.
Lum, Genevieve S., 4,613,548, Cl. 428-411.100.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,613,341, Cl. 44-57.000.

Eubanks Engineering Co.: *See—*
Talley, Lloyd A., 4,612,696, Cl. 29-564.400.

Evans, Christopher J.: *See—*
Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., 4,613,586, Cl. 514-13.000.

Evans, Gary E., to Westinghouse Electric Corp. Device for switching between linear and circular polarization using rotation in an axis across a square waveguide. 4,613,836, Cl. 333-159.000.

Evenson, William R., to Lefco Western, Inc. Evacuated pumping system. 4,613,290, Cl. 417-517.000.

EVVA-Werk Spezialerzeugung Von Zylinder- und Sicherheitsschlossern m.b.H. & Co., Kommanditgesellschaft: *See—*
Prunbauer, Kurt; and Paar, Adalbert, 4,612,787, Cl. 70-358.000.

Ex-Cell-O Corporation: *See—*
Millay, Lawrence I.; and Dzewaltowski, Victor F., 4,612,735, Cl. 51-217.00R.

Exxon Production Research Co.: *See—*
Rakach, Alec; and Bombardieri, Caurino C., 4,612,989, Cl. 166-263.000.

Exxon Research & Engineering Co.: *See—*
Aliani, Giorgio; Lechat, Jacques B.; and Smits, Jozef A. F., 4,613,632, Cl. 523-172.000.
Barthomeuf, Denise M., 4,613,725, Cl. 585-828.000.
Gunter, Wolfgang; and Nespoli, Guido, 4,613,923, Cl. 361-315.000.
Schorfheide, James J., 4,613,424, Cl. 208-65.000.
Swan, George A.; Baird, William C., Jr.; and Corry, Robert G., 4,613,423, Cl. 208-65.000.

F. L. Smidth & Co.: *See—*
Reyes, Victor; and Kristensen, Eigil, 4,613,346, Cl. 55-4.000.

Fabriques de Tabac Reunies, S.A.: *See—*
Berger, Maurice; and Bernasconi, Jean-Francois, 4,613,032, Cl. 198-409.000.

FAG Kugelfischer Georg Schafer (KGaA): *See—*
Hofmann, Heinrich; and Heurich, Gunther, 4,613,239, Cl. 384-580.000.

Fairbairn, Terence W. F.; and Capewell, Terence J., to Lucas Industries Public Limited Company. Device for limiting output force applied by a rotary transmission. 4,613,023, Cl. 192-8.00R.

Fairchild, Elwood M.: *See—*
Zanias, Theodore J.; and Fairchild, Elwood M., 4,613,297, Cl. 431-16.000.

Falke, Wilbert L.; Lee, Agnes Y.; and Neumeier, Leander A., to United States of America, Interior. Method for soldering aluminum and magnesium. 4,613,069, Cl. 228-211.000.

Falkner, Horst: *See—*
Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, 4,612,747, Cl. 52-250.000.

Fallon, Merton R., to Draft Systems, Inc. Valve assembly and coupler therefor. 4,612,952, Cl. 137-212.000.

Fantini, Vincenzo: *See—*
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, 4,613,206, Cl. 350-174.000.

Farnham, Larry: *See—*
Schroeder, Charles H.; and Farnham, Larry, 4,613,129, Cl. 272-73.000.

Farone, William A.: *See—*
Gunnerman, Rudolf W.; and Farone, William A., 4,613,339, Cl. 44-1.00D.

Fearnhead, Graham R.: *See—*
Wong, Andrew C. C.; Fearnhead, Graham R.; and Gale, Simon J., 4,613,977, Cl. 375-97.000.

Fechalos, William A.; and Pitroda, Satyan G., to Rockwell International Corp. Electronic telephone with feature access and speed dialing including loop breaks. 4,613,730, Cl. 179-81.00R.

Federal-Mogul Corporation: *See—*
Butler, John D., 4,613,143, Cl. 277-134.000.

Federal Signal Corporation: *See—*
Eggers, Frederick W.; Graham, Paul D.; and Heeb, Bruce E., 4,613,797, Cl. 315-241.00R.

Feldmuhle Aktiengesellschaft: *See—*
Ehrl, Peter A., 4,613,308, Cl. 433-173.000.

Feller, Murray F. Orbital ball flow detection apparatus. 4,612,806, Cl. 73-195.000.

Fende, John R.; Furnish, Gregory R.; and Grimsley, Richard L., to Cincinnati Microwave, Inc. Police radar warning receiver. 4,613,989, Cl. 455-351.000.

Fergason, James L., to Manchester R & D Partnership. Liquid crystal projector and method. 4,613,207, Cl. 350-331.00R.

Fernwood, George G.; and Burd, Samuel, to Bio-Rad Laboratories, Inc. Method and apparatus for drying gel slabs. 4,612,710, Cl. 34-16.000.

Ferranti PLC: *See—*
Manners-Smith, John; Thompson, Christopher G.; and Bailey, John E., 4,612,720, Cl. 40-211.000.

Ferrell, Mike C. Random movement, motorized water fowl decoy. 4,612,722, Cl. 43-3.000.

Ferro Enamels (Japan) Limited: *See—*
Hoshino, Yutaka; Kataoka, Koji; and Asanaka, Yasumasa, 4,613,628, Cl. 521-72.000.

Feuerstein, Albert: *See—*
Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, 4,613,306, Cl. 432-264.000.

Feuerstein, Helmut: *See—*
Geisler, Edda; Feuerstein, Helmut; and Lange, Hans, 4,613,569, Cl. 435-26.000.

Firmenich SA: *See—*
Buchi, George H.; and Wuest, Hans, 4,613,710, Cl. 568-819.000.

Fisher, Paul J.: *See—*
Fisher, Ronald T.; Fisher, Paul J.; and Spain, David P., 4,613,984, Cl. 378-185.000.

Fisher, Ronald T.; Fisher, Paul J.; and Spain, David P., to Du Pont de Nemours, E. I., and Company. Quick film release x-ray cassette mechanism. 4,613,984, Cl. 378-185.000.

Fitsch, Margot. Trauma board and method of using same. 4,612,678, Cl. 5-82.00R.

Fitzwater, Margaret: *See—*
Ward, Wendell; Kumar, Surinder; Mack, Melba; Keller, Lewis; and Fitzwater, Margaret, 4,613,509, Cl. 426-283.000.

Flammann, Norbert: *See—*
Henn, Stefan; and Flammann, Norbert, 4,612,836, Cl. 83-729.000.

Flatau, Abraham. Projectile. 4,612,860, Cl. 102-518.000.

Fleche, Guy: *See—*
Huchette, Michel; Fleche, Guy; and Gosset, Serge, 4,613,407, Cl. 162-175.000.

Fleck, Barbara H.: *See*—
Boiarski, Anthony A.; Fleck, Barbara H.; Meierhoefer, Eugene J.; and Razgaitis, Richard, 4,612,926, Cl. 128-200.210.
FLM Building Products, Inc.: *See*—
James, Charles E., 4,613,263, Cl. 410-32.000.
Flock, Franz: *See*—
Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, 4,613,203, Cl. 350-6.600.
Floyd, Middleton B., Jr.; and Goidl, Jo A., to American Cyanamid Company. Method of treating diabetes mellitus using arylglyoxals. 4,613,611, Cl. 514-443.000.
FMC Corporation: *See*—
Green, Joseph, 4,613,699, Cl. 568-15.000.
Focke & Co.: *See*—
Focke, Heinz; and Langer, Horst, 4,612,756, Cl. 53-579.000.
Focke & Co., (GmbH & Co): *See*—
Focke, Heinz; and Mutschall, Hugo, 4,613,033, Cl. 198-457.000.
Focke, Heinz; and Langer, Horst, to Focke & Co. Apparatus for introducing cigarette groups into cigarette packs. 4,612,756, Cl. 53-579.000.
Focke, Heinz; and Mutschall, Hugo, to Focke & Co., (GmbH & Co). Apparatus for the introduction of objects, especially packets, into a packet tower. 4,613,033, Cl. 198-457.000.
Foerster, Gerhard, to Montgomery, Jane G. Telephone cord terminating plug. 4,613,196, Cl. 339-97.00P.
Foglesonger, John D.; and Masters, Robert A., to ITT Corporation. Machined waveguide. 4,613,839, Cl. 333-239.000.
Foley, Geoffrey M. T.; Markovics, James M.; Berkes, John S.; Badesha, Santokh S.; and Abkowitz, Martin A., to Xerox Corporation. Photoresponsive imaging members with chemically modified photoconductive layers. 4,613,557, Cl. 430-59.000.
Folkert, Thomas E.: *See*—
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., 4,613,345, Cl. 51-293.000.
Fondation Suisse pour la Recherche en Microtechnique: *See*—
Genequand, Pierre; and Schwab, Philippe, 4,613,105, Cl. 248-178.000.
Fong, Ronald A.: *See*—
Casella, Victor M.; and Fong, Ronald A., 4,613,332, Cl. 8-111.000.
Ford Aerospace & Communications Corporation: *See*—
Stonier, Roger A., 4,613,870, Cl. 343-915.000.
Ford, Douglas L., to Memtec Limited. Substituted aliphatic polyamide porous membranes. 4,613,625, Cl. 521-53.000.
Ford Motor Company: *See*—
Esper, Michael J.; Haeberle, Russell J.; and Winegar, Brian G., 4,613,843, Cl. 336-232.000.
Greene, Thomas L., 4,612,826, Cl. 74-863.000.
Hartman, Nile F., 4,613,200, Cl. 350-3.700.
Kraus, Richard A.; and Sabon, Thomas W., 4,613,802, Cl. 318-483.000.
Forester, Roger J.; and White, Lloyd R., to Minnesota Mining and Manufacturing Company. Uniform minimum-permeability woven fabric, filter, and process therefor. 4,613,350, Cl. 65-2.000.
Forintek Canada Corp.: *See*—
Clarke, Michael R.; and Troughton, Gary E., 4,612,802, Cl. 73-73.000.
Forman, Ernest H. Method and apparatus for generating hierarchical displays. 4,613,946, Cl. 364-518.000.
Formflo Limited: *See*—
Andriessen, Ronald C., 4,612,789, Cl. 72-71.000.
Forster, Ludwig; Franke, Alois; and Nobel, Reinhard, to Swiss Aluminium Ltd. Carbon paste and process for its manufacture. 4,613,375, Cl. 106-281.00R.
Forsyth, John L., to Sanders, Royden C., Jr. Dot matrix print head. 4,613,242, Cl. 400-124.000.
Fosdick, Frank D., Jr.; and Browder, Jerald L. Well cleaning apparatus and treating method. 4,612,986, Cl. 166-171.000.
Foster, John P., to Westinghouse Electric Corp. Water reactor fuel cladding. 4,613,479, Cl. 376-416.000.
Foster Wheeler Energy Corporation: *See*—
McClanahan, Richard C., 4,613,952, Cl. 364-578.000.
Foulletier, Louis; and Lantz, Andre , to Produits Chimiques Ugine Kuhlmann. Process for the manufacture of fluorinated alkanols and esters thereof. 4,613,681, Cl. 560-236.000.
Fox, Dennis L.: *See*—
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., 4,613,345, Cl. 51-293.000.
Foxboro Company, The: *See*—
Cheney, M. Charles, 4,613,482, Cl. 422-51.000.
Frame, Robert R., to UOP Inc. Process for the oligomerization of olefins and a catalyst thereof. 4,613,580, Cl. 502-117.000.
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, to Alfa Romeo Auto S.p.A; and CISE-Centro Informazioni Studi Esperienze S.p.A. System for the flexible composition of laser beams. 4,613,206, Cl. 350-174.000.
Frank, Volker: *See*—
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, 4,613,095, Cl. 242-198.000.
Franke, Alois: *See*—
Forster, Ludwig; Franke, Alois; and Nobel, Reinhard, 4,613,375, Cl. 106-281.00R.
Franke, Sr., John, to Singer Company, The; and AVG Productions, Inc. Material handling device. 4,613,123, Cl. 271-18.300.
Franklin, James, to Solvay & Cie. Process for the pyrolytic dehydrochlorination of haloalkanes in the presence of an initiator based on chlorinated product and the initiator employed in such a process. 4,613,709, Cl. 570-227.000.
Fraser, Michael J., to Refurbished Turbine Components Limited. Methods of repair. 4,613,744, Cl. 219-200.000.
Fred W. Gretsch Enterprises, Ltd.: *See*—
Gretsch, Fred W.; Cook, Roy D.; and Iler, Bobby C., 4,612,840, Cl. 84-269.000.
Freeman, Barrie A.: *See*—
Cherry, Peter J.; and Freeman, Barrie A., 4,613,223, Cl. 354-322.000.
Friedman, Arthur J.: *See*—
Gill, Jasbir S.; and Friedman, Arthur J., 4,613,481, Cl. 422-16.000.
Frito-Lay, Inc.: *See*—
Ward, Wendell; Kumar, Surinder; Mack, Melba; Keller, Lewis; and Fitzwater, Margaret, 4,613,509, Cl. 426-283.000.
Fritzsche, Harold L., to General Electric Company. Lanced strip and edgewise wound core. 4,613,780, Cl. 310-216.000.
Frohbach, Hugh F., to Nippon Kogaku K.K. Small photoelectric reading apparatus. 4,613,759, Cl. 250-566.000.
Frye, John A.: *See*—
Adee, James M.; and Frye, John A., 4,612,737, Cl. 51-310.000.
Fuerter, Gerhard; and Lahres, Hans, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Spectacle lens having astigmatic power. 4,613,217, Cl. 351-176.000.
Fuganti, Claudio: *See*—
Casati, Paolo; Elefante, Biagio; and Fuganti, Claudio, 4,613,460, Cl. 560-41.000.
Fuhrer, Walter; Buhlmayer, Peter; Rasetti, Vittorio; and Riniker, Bernhard, to Ciba-Geigy Corporation. Substituted 5-amino-4-hydroxyvaleryl derivatives. 4,613,676, Cl. 560-39.000.
Fuhrig, Wolfgang: *See*—
Meuresch, Herbert; and Fuhrig, Wolfgang, 4,613,061, Cl. 222-82.000.
Fuhs, James G. Strainer. 4,613,439, Cl. 210-471.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Ide, Tohru; and Okamura, Minoru, 4,612,828, Cl. 74-866.000.
Iwanaga, Toshikazu; and Hara, Kazuo, 4,612,892, Cl. 123-438.000.
Fuji Koki Manufacturing Co., Ltd.: *See*—
Yoshiga, Kenji, 4,612,795, Cl. 72-478.000.
Fuji Photo Film Co., Ltd.: *See*—
Kimura, Akinori; and Ohtsuka, Shuichi, 4,613,226, Cl. 355-10.000.
Murai, Ashita, 4,613,563, Cl. 430-523.000.
Ohta, Takahiro, 4,613,911, Cl. 360-3.000.
Seshimoto, Osamu; Saito, Yoshio; Koizumi, Teruaki; and Terashima, Masaaki, 4,613,420, Cl. 204-412.000.
Seshimoto, Osamu; Koizumi, Teruaki; Saito, Yoshio; and Yamaguchi, Akira, 4,613,421, Cl. 204-412.000.
Tabei, Masatoshi, 4,613,404, Cl. 156-643.000.
Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, 4,613,221, Cl. 354-321.000.
Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, 4,613,222, Cl. 354-321.000.
Uesugi, Akio; Kakei, Tsutomu; and Takeuchi, Makoto, 4,613,413, Cl. 204-33.000.
Utsugi, Mikio, 4,613,910, Cl. 358-310.000.
Fujii, Tadashiro: *See*—
Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, 4,613,666, Cl. 544-277.000.
Fujiie, Kazuhiko: *See*—
Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, 4,613,967, Cl. 369-221.000.
Fujinami, Kimiya: *See*—
Nakayama, Takeo; Fujinami, Kimiya; Sakamoto, Takurou; and Doura, Fumihiro, 4,613,652, Cl. 525-276.000.
Fujisaki, Koichiro: *See*—
Irikura, Koji; Hikishima, Keisaku; and Fujisaki, Koichiro, 4,613,024, Cl. 192-18.00A.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, 4,613,608, Cl. 514-357.000.
Fujita, Tamio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Side mold for an automobile. 4,613,178, Cl. 293-128.000.
Fujita, Yoshiaki: *See*—
Umeha, Genkichi; Fujita, Yoshiaki; and Shimura, Atsushi, 4,612,695, Cl. 29-505.000.
Fujita, Yosuke: *See*—
Kuwata, Jun; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,613,546, Cl. 428-336.000.
Fujitsu Limited: *See*—
Fukuda, Takeshi; Mitono, Yoshiharu; and Kiriseko, Tadashi, 4,613,887, Cl. 357-43.000.
Hoshino, Eiichi, 4,613,401, Cl. 156-643.000.
Sakurai, Junji, 4,613,305, Cl. 432-253.000.
Fujitsuka, Nobuyoshi: *See*—
Suzuka, Masakazu; Ohashi, Hiromu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,613,947, Cl. 364-526.000.
Fujiwara, Akinori: *See*—
Tsuge, Hiroshi; Fujiwara, Akinori; Iwasa, Hiroki; Nagasaka, Chikao; and Murasoka, Tsutomu, 4,613,188, Cl. 297-250.000.

Fujiwara, Osamu: *See*—
Miyake, Norihisa; Tsuchihashi, Akira; Fujiwara, Osamu; Hashimoto, Yasuhiro; and Maruyama, Yutaka, 4,613,943, Cl. 364-513.000.

Fukami, Harukazu; Inoue, Shinya; Nitta, Issei; Nakao, Kenichiro; and Kikumoto, Ryoji, to Mitsubishi Chemical Industries Limited. Piperazine derivatives and their acid addition salts. 4,613,598, Cl. 514-211.000.

Fukaya, Chikara; Naito, Youichiro; and Yokoyama, Kazumasa, to Green Cross Corporation, The. Prostaglandin I_2 ester and fat emulsion containing the same. 4,613,614, Cl. 514-469.000.

Fukaya, Chikara: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.

Fukaya, Hiroshi; Takada, Yuji; and Tamachi, Masao, to Handozer Industry Co., Ltd. Lever operating device in excavator. 4,612,829, Cl. 74-876.000.

Fukuda Denshi Co., Ltd.: *See*—
Yamaguchi, Kimio; and Chiba, Yoshinori, 4,612,936, Cl. 128-644.000.

Fukuda, Tadaji: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,613,558, Cl. 430-84.000.

Fukuda, Takeshi; Mitono, Yoshiharu; and Kiriseko, Tadashi, to Fujitsu Limited. Semiconductor device with a means for discharging carriers. 4,613,887, Cl. 357-43.000.

Fukuda, Tamio: *See*—
Sato, Eiji; Fukuda, Tamio; Ishii, Masaharu; Nakamura, Mitsuru; and Nakamura, Yozo, 4,613,285, Cl. 417-214.000.

Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, to Toyo Jozo Kabushiki Kaisha. Neplanocin A derivatives. 4,613,666, Cl. 544-277.000.

Fukunaga, Yukio: *See*—
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,613,153, Cl. 280-689.000.

Fukushima, Isao: *See*—
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.

Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., to General Foods Corporation. Malt-like flavor from cereal grain root cultures. 4,613,507, Cl. 426-28.000.

Fulton Manufacturing Corporation: *See*—
Schwartz, Edward J., 4,613,249, Cl. 403-3.000.

Fumei, Giancarlo J., to Owens-Illinois, Inc. Container with solid plastic label and method of applying the label. 4,612,721, Cl. 40-310.000.

Furch, Benjamin; and Seidensticker, Jens, to Rheinmetall GmbH. Multiple purpose warhead. 4,612,859, Cl. 102-476.000.

Furnish, Gregory R.: *See*—
Fende, John R.; Furnish, Gregory R.; and Grimsley, Richard L., 4,613,989, Cl. 455-351.000.

Furuhashi, Hiroyuki; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,613,579, Cl. 502-115.000.

Furukawa Electric Co., Ltd.: *See*—
Seiji, Shibuya; Tuguo, Satoh; Wataru, Komatsu; and Takeo, Shimuzu, 4,613,205, Cl. 350-96.250.

Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,613,144, Cl. 280-91.000.

Furutsu, Akira, to Japan Bano'k Co., Ltd. Method of connecting ends of filamentary fastener. 4,612,694, Cl. 29-450.000.

Furuya, Tsuneo: *See*—
Hori, Katsuya; and Furuya, Tsuneo, 4,613,965, Cl. 369-59.000.

Furuzono, Yoshihisa: *See*—
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.

FWM Enterprises, Inc.: *See*—
McGunnigle, Roger J., 4,613,247, Cl. 400-486.000.

G. Siempelkamp GmbH & Co.: *See*—
Gerhardt, Klaus, 4,613,293, Cl. 425-371.000.

Gabel, Robert A.: *See*—
Kurth, Richard R.; and Gabel, Robert A., 4,613,978, Cl. 375-99.000.

Gaboardi, Angelo: *See*—
Rossi, Mario; and Gaboardi, Angelo, 4,613,243, Cl. 400-124.000.

Gal, Laszlo V., to Burroughs Corporation. Integrated circuit having three power bases and proportioned parasitic resistive and capacitive coupling to reduce output noise. 4,613,771, Cl. 307-443.000.

Gale, Simon J.: *See*—
Wong, Andrew C. C.; Fearnhead, Graham R.; and Gale, Simon J., 4,613,977, Cl. 375-97.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Athletic shoe pocket with rear flap. 4,612,714, Cl. 36-136.000.

Gammans, Richard E.; Smith, David W.; and Yevich, Joseph P., to Mead Johnson & Company. Antidepressant 1,2,4-triazolone compounds. 4,613,600, Cl. 514-252.000.

Gammerler, Hagen. Device for cutting out a waste strip between two usable strips. 4,612,835, Cl. 83-500.000.

Gann, Larry N., to Button Sling, Inc. Shooting and carrying sling for guns. 4,613,067, Cl. 224-150.000.

Gantt, John V., to Gatomba, Inc. Archery release aid. 4,612,907, Cl. 124-35.00A.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Wunderer, Bernd, 4,612,807, Cl. 73-580.000.

Garb, Charles E.: *See*—
Golub, Samuel G.; and Garb, Charles E., 4,612,718, Cl. 40-21.00C.

Gardner, John O.: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,613,606, Cl. 514-307.000.

Garifo, Luciano: *See*—
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, 4,613,206, Cl. 350-174.000.

Garrett Corporation, The: *See*—
McInerney, Charles E., 4,613,288, Cl. 417-407.000.

Garrettson, Garrett A.: *See*—
Siddall, Graham J.; Eaton, Steven G.; Kruger, James B.; Garrettson, Garrett A.; and Neukermans, Armand P., 4,613,981, Cl. 378-34.000.

Garrott, Isaac. Demountable collapsible trash bag support. 4,613,104, Cl. 248-97.000.

Gas Spring Company, Division of Fichtel & Sachs Industries, Inc.: *See*—
Smith, Richard C., 4,613,115, Cl. 267-64.250.

Gatomba, Inc.: *See*—
Gantt, John V., 4,612,907, Cl. 124-35.00A.

Gearhart Industries, Inc.: *See*—
Terrell, Jamie B.; and Holmes, Benny J., 4,613,394, Cl. 156-345.000.

Gebhardt, Peter: *See*—
Schubert, Ernst W.; and Gebhardt, Peter, 4,612,929, Cl. 128-204.250.

Geimuplast Peter Mundt GmbH & Co. KG: *See*—
Neuhold, Arnold; and Pohl, Claus, 4,612,754, Cl. 53-457.000.

Geisel, Gerhard: *See*—
Krumme, Manfred; and Geisel, Gerhard, 4,613,352, Cl. 65-158.000.

Geisler, Edda; Feuerstein, Helmut; and Lange, Hans, to Boehringer Mannheim GmbH. Stabilized composition of tetrazolium salts. 4,613,569, Cl. 435-26.000.

Geisselmann, Heribert: *See*—
Rosch, Joachim; Geisselmann, Heribert; and Wagner, Richard, 4,612,867, Cl. 112-314.000.

Geissler, Rainer, to ANT Nachrichtentechnik GmbH. Reflection phase shifter. 4,613,835, Cl. 333-159.000.

Gelston, Norbert E., II, to U.S. Tech Corporation. Microwave detection system. 4,613,812, Cl. 324-58.50B.

Gemmill, Robert M., Jr.: *See*—
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., 4,613,343, Cl. 44-71.000.

Gendron, Florian. Apparatus for producing sloping panels. 4,612,837, Cl. 83-864.000.

Genequand, Pierre; and Schwab, Philippe, to Fondation Suisse pour la Recherche en Microtechnique. Device for aligning optical components. 4,613,105, Cl. 248-178.000.

General Binding Corporation: *See*—
Scharer, Roger M., 4,613,266, Cl. 412-40.000.

General Director of the Agency of Industrial Science and Technology: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.

General Electric Company: *See*—
Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., 4,613,368, Cl. 75-246.000.
Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., 4,613,480, Cl. 419-30.000.
Dietz, Peter W.; and Miller, Russell S., 4,613,076, Cl. 239-3.000.
Edelstein, William A.; Eisner, David R.; Redington, Rowland W.; and Smith, Lowell S., 4,613,820, Cl. 324-318.000.
Fritzsche, Harold L., 4,613,780, Cl. 310-216.000.
Glover, Gary H.; and O'Donnell, Matthew, 4,613,949, Cl. 364-527.000.
Heitman, Christopher J.; and Schwehr, Gregory D., 4,613,926, Cl. 362-32.000.
Itani, Abdallah M.; and Roberts, Victor D., 4,613,795, Cl. 315-205.000.
Nied, Herman A.; and Baheti, Radhakisan S., 4,613,743, Cl. 219-130.210.
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,613,882, Cl. 357-23.300.
Roberts, Victor D., 4,613,841, Cl. 336-83.000.
Steele, Douglas S., 4,613,313, Cl. 445-28.000.
Steele, Douglas S., 4,613,314, Cl. 445-28.000.

General Foods Corporation: *See*—
Barnett, Ronald E.; and Yarger, Ronald G., 4,613,512, Cl. 426-548.000.
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,613,507, Cl. 426-28.000.

Gentile, Anthony L.; Kyle, Nanse R.; and Hill, Fred W., to Hughes Aircraft Company. Growth of single crystal Cadmium-Indium-Telluride. 4,613,495, Cl. 423-508.000.

Gentran, Inc.: *See*—
Sarasohn, Niel L., 4,612,811, Cl. 73-706.000.

Geo-Sensors Corporation: *See*—
Zeamer, Geoffrey H., 4,613,816, Cl. 324-248.000.

Gerdes, Richard C.: *See*—
Vokac, Peter R.; and Gerdes, Richard C., 4,613,974, Cl. 375-37.000.

Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Belt-type press for making particleboard, fiberboard, and like pressedboard products. 4,613,293, Cl. 425-371.000.

Gerlach, Klaus; Mathes, Nikolaus; Pitowski, Hans-Jurgen; and Wechs, Friedbert, to Akzona Incorporated. Process for making suede-like sheet material. 4,612,688, Cl. 28-104.000.

Germann, Alfred: *See—*
Boller, Arthur; Germann, Alfred; Petrzilka, Martin; and Schadt, Martin, 4,613,208, Cl. 350-349.000.

Gesellschaft fur Schwerionenforschung mbH Darmstadt: *See—*
Spohr, Reimar, 4,613,351, Cl. 65-22.000.

Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen: *See—*
Dietrich, Ralph; Jocham, Dieter; Unsold, Eberhard; Weinsheimer, Wolfram; and Gorisch, Wolfram, 4,612,938, Cl. 128-665.000.

Gesing, Adam J.: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Mitchell, David N.; and Pant, Aniket, 4,613,418, Cl. 204-243.00R.

Gesipa Blindniettechnik Gesellschaft mit beschrankter Haftung: *See—*
Klein, Gunter, 4,612,793, Cl. 72-311.000.

Gess, Jerome M., to Weyerhaeuser Company. Method of measuring drainage rate. 4,613,406, Cl. 162-49.000.

GETRAG Getriebe-und Zahnradfabrik GmbH: *See—*
Ruhle, Gunter, 4,612,824, Cl. 74-665.00F.

Gewerkschaft Eisenhutte Westfalia: *See—*
Weirich, Walter; and Dettmers, Michael, 4,613,257, Cl. 405-302.000.

Ghajar, Jamshid B. G. Method and apparatus for guiding catheter into ventricular system of human brain. 4,613,324, Cl. 604-49.000.

Gharavi, Hamid, to Bell Communications Research, Inc. Conditional quantization grey level and color image coding apparatus. 4,613,948, Cl. 364-526.000.

Giannini, Umberto: *See—*
Longi, Paolo; Giannini, Umberto; Mazzocchi, Romano; and Deluca, Domenico, 4,613,655, Cl. 526-114.000.

Gildenblat, Gennady: *See—*
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,613,882, Cl. 357-23.300.

Gilhousen, Klein S.; Newby, Charles F., Jr.; and Moerder, Karl E., to M/A-COM Linkabit, Inc. Signal encryption and distribution system for controlling scrambling and selective remote descrambling of television signals. 4,613,901, Cl. 358-122.000.

Gill, Jasbir S.; and Friedman, Arthur J., to Calgon Corporation. Mercapthothiazoline corrosion inhibiting compositions. 4,613,481, Cl. 422-16.000.

Gimple, James J.; and Lasley, Charles T., to Champion Spark Plug Company. Electrostatic spraying apparatus for robot mounting. 4,613,082, Cl. 239-690.000.

Giorgetti, Alberto, to Brembo S.p.A. Disk brake assembly. 4,613,019, Cl. 188-73.310.

Girolami, Antoine. Coagulometer and method of measuring of the time of coagulation of samples of fluid products. 4,612,801, Cl. 73-64.100.

Glancy, Jerry L.: *See—*
Smith, Keith O.; and Glancy, Jerry L., 4,613,099, Cl. 244-53.00R.

Glass, Emmett F.: *See—*
Wagstaff, Robert A.; and Glass, Emmett F., 4,612,855, Cl. 100-5.000.

Glaxo Group Limited: *See—*
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,613,597, Cl. 514-211.000.

Glaze, John W., Jr.; and Cline, Ernest E., to Intech Corporation. Method of handling hosiery. 4,613,065, Cl. 223-37.000.

Gloppen, Edward C.; and Scott, Norman L., to Dur-O-Wal, Inc. Dapped end reinforcement assembly for precast prestressed concrete members. 4,612,751, Cl. 52-723.000.

Glover, Gary H.; and O'Donnell, Matthew, to General Electric Company. Composite pulses for time reversal in NMR imaging. 4,613,949, Cl. 364-527.000.

GNB Incorporated: *See—*
Jergl, Joseph J.; and Kump, William H., 4,613,550, Cl. 429-53.000.

Godard, Dominique, to International Business Machines Corp. Method of cancelling listener echo in a digital data receiver, and device for implementing said method. 4,613,731, Cl. 179-170.200.

Godbille, Etienne, to Roussel UCLAF. Apparatus to concentrate solutions and to recover solvents. 4,613,405, Cl. 159-13.300.

Goddard, Richard: *See—*
Balmer, Clifford J.; and Goddard, Richard, 4,612,846, Cl. 91-457.000.

Godfrey, James F.: *See—*
Bergman, Hyman C.; Godfrey, James F.; and Gordon, Virginia C., 4,613,574, Cl. 436-2.000.

Goel, Anil B.; Richards, Harvey J.; and Grimm, Robert A., to Ashland Oil, Inc. Polyol/polyepoxide/polyurethane adhesive. 4,613,660, Cl. 528-73.000.

Goel, Anil B., to Ashland Oil, Inc. Process for catalytic preparation of poly(ether-amide) polymeric composition from oxazoline and polyphenol. 4,613,662, Cl. 528-137.000.

Gohler, Bernhard: *See—*
Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, 4,612,747, Cl. 52-250.000.

Goidl, Jo A.: *See—*
Floyd, Middleton B., Jr.; and Goidl, Jo A., 4,613,611, Cl. 514-443.000.

Gokcen, Cem; and Williams, Robert J., to Baxter Travenol Laboratories, Inc. Layered thermoplastic articles and method for forming. 4,613,531, Cl. 428-35.000.

Goldberg, Eugene P.: *See—*
Deisler, Richard J.; and Goldberg, Eugene P., 4,613,640, Cl. 524-264.000.

Goldstein, Amnon: *See—*
Spencer, David R.; Goldstein, Amnon; Grey, David; Balchunas, Theodore G.; and Kaplan, Arthur B., 4,613,877, Cl. 346-160.000.

Golinsky, Martin, to Grumman Aerospace Corporation. Passive ranging of an airborne emitter by a single non-maneuvering or stationary sensor. 4,613,867, Cl. 343-458.000.

Golub, Samuel G.; and Garb, Charles E., to Graham Field, Inc. Hospital identification bands. 4,612,718, Cl. 40-21.00C.

Gonsiorawski, Ronald C.; and Yates, Douglas A., to Mobil Solar Energy Corporation. Method of fabricating solar cells. 4,612,698, Cl. 29-572.000.

Goodby, John W.; and Leslie, Thomas M., to AT&T Bell Laboratories. Smectic liquid crystals. 4,613,209, Cl. 350-350.00S.

Gordon, James F. Bicycle and stationary seats. 4,613,187, Cl. 297-195.000.

Gordon, Virginia C.: *See—*
Bergman, Hyman C.; Godfrey, James F.; and Gordon, Virginia C., 4,613,574, Cl. 436-2.000.

Gordon, William E.: *See—*
Loren, Norman S.; and Gordon, William E., 4,613,177, Cl. 293-120.000.

Gorisch, Wolfram: *See—*
Dietrich, Ralph; Jocham, Dieter; Unsold, Eberhard; Weinsheimer, Wolfram; and Gorisch, Wolfram, 4,612,938, Cl. 128-665.000.

Goschke, Richard, to Ciba-Geigy Corporation. Method of treating thrombotic disease with pyridazinones. 4,613,599, Cl. 514-234.000.

Gose, Horst: *See—*
Baisch, Roderich; Gose, Horst; and Papiernik, Wolfgang, 4,612,709, Cl. 33-125.00R.

Gosset, Serge: *See—*
Huchette, Michel; Fleche, Guy; and Gosset, Serge, 4,613,407, Cl. 162-175.000.

Gotaverken Arendal AB: *See—*
Edberg, Nils; Kores, Ivar; Holmkvist, Gottfrid; and Helmerson, Rickard, 4,613,001, Cl. 175-52.000.

Goto, Katsuhiko: *See—*
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.

Goulds Pumps, Incorporated: *See—*
Lubieniecki, Valdemar M., 4,613,281, Cl. 415-170.00B.

Gozdziewicz, Zygmunt: *See—*
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,790, Cl. 72-96.000.
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,791, Cl. 72-98.000.

Graf, Matthew C.: *See—*
Culican, Edward F.; Graf, Matthew C.; and Ritchie, Leonard C., 4,613,958, Cl. 365-189.000.

Grage, Ludger: *See—*
Brumme, Gerhard; Grage, Ludger; Heynisch, Hinrich; and Hubner, Erwin, 4,613,971, Cl. 372-87.000.

Graham, Art: *See—*
Raba, John B.; and Graham, Art, 4,613,136, Cl. 273-1.50R.

Graham Field, Inc.: *See—*
Golub, Samuel G.; and Garb, Charles E., 4,612,718, Cl. 40-21.00C.

Graham, Paul D.: *See—*
Eggers, Frederick W.; Graham, Paul D.; and Heeb, Bruce E., 4,613,797, Cl. 315-241.00R.

Grammatica, Steven J.: *See—*
Mort, Joseph; Jansen, Frank; Okumura, Koji; Grammatica, Steven J.; and Morgan, Michael A., 4,613,556, Cl. 430-57.000.

Granum, Michael J.; and Steffan, Walter J. Food processing machine. 4,613,086, Cl. 241-101.00B.

Graphics 3 Inc.: *See—*
Herlin, Robert M.; and Sutton, Richard W., 4,613,391, Cl. 156-213.000.

Gray, Reed A.: *See—*
Hyzak, Daniel L.; and Gray, Reed A., 4,613,358, Cl. 71-100.000.

Gray Tool Company: *See—*
Karr, Michael A., Jr., 4,612,983, Cl. 166-55.000.

Green Cross Corporation, The: *See—*
Fukaya, Chikara; Naito, Youichiro; and Yokoyama, Kazumasa, 4,613,614, Cl. 514-469.000.
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.

Green, Dennis A.; and Purcell, Thomas L. Method and apparatus for sampling hazardous material. 4,612,815, Cl. 73-864.110.

Green, Joseph, to FMC Corporation. Phosphine oxides and their use as flame retardants in styrene modified polyphenylene ether resins. 4,613,699, Cl. 568-15.000.

Greene, Thomas L., to Ford Motor Company. Transmission throttle valve modulator responsive to both positive manifold pressure and negative manifold pressure. 4,612,826, Cl. 74-863.000.

Greenwood, William P. Safety platform assembly for sanding trucks. 4,613,155, Cl. 280-760.000.

Greff, Frank, Sr. Dual wheel cleaner. 4,613,145, Cl. 280-158.00A.

Gregory, James L.; and Wolfe, Steven R., to Owens-Illinois, Inc. Tamper-indicating closure, container and combination thereof. 4,613,052, Cl. 215-252.000.

Grehier, Alain; Rojey, Alexandre; and Benoist, Francois, to Institut Francais du Petrole. Heat exchanger of modular structure. 4,612,982, Cl. 165-166.000.

Greifer, Claire R. Comfort accessories for brassieres. 4,612,935, Cl. 128-510.000.

Gretsch, Fred W.; Cook, Roy D.; and Iler, Bobby C., to Fred W. Gretsch Enterprises, Ltd. Musical instrument with a plurality of strings. 4,612,840, Cl. 84-269.000.

Grey, David: *See—*
Spencer, David R.; Goldstein, Amnon; Grey, David; Balchunas, Theodore G.; and Kaplan, Arthur B., 4,613,877, Cl. 346-160.000.

Grimm, Robert A.: *See—*
Goel, Anil B.; Richards, Harvey J.; and Grimm, Robert A., 4,613,660, Cl. 528-73.000.

Grimsley, Richard L.: *See—*
Fende, John R.; Furnish, Gregory R.; and Grimsley, Richard L., 4,613,989, Cl. 455-351.000.

Gripper, Inc.: *See—*
Reneau, Bobby J., 4,613,160, Cl. 285-18.000.

Grisoni, Lino: *See—*
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, 4,613,206, Cl. 350-174.000.

Gross, William H.; and Naokawa, Toyojiro, to National Semiconductor Corporation. Direct current coupled peak to peak detector circuit. 4,613,769, Cl. 307-351.000.

Grosshandler, Sandor, to Dow Chemical Company, The. Joint for pipe. 4,613,163, Cl. 285-27.000.

Grothe, Horst, to SMS Schloemann-Siemag AG. Guiding device for an oscillating continuous casting mold. 4,612,970, Cl. 164-416.000.

Groves, Gerald M. Light system for trucks. 4,613,846, Cl. 340-106.000.

Grumman Aerospace Corporation: *See—*
Golinsky, Martin, 4,613,867, Cl. 343-458.000.

Grunstra, Robert E.: *See—*
Burd, Lamar; Miller, Evan R.; Carozza, Eugene J.; and Grunstra, Robert E., 4,612,969, Cl. 164-122.200.

GTE Communication Systems Corporation: *See—*
Draayer, Johannes, 4,613,969, Cl. 370-58.000.
Pommer, Karl E., II, 4,613,768, Cl. 307-350.000.

GTE Laboratories Incorporated: *See—*
Sandman, Daniel J.; Stark, James C.; and Acampora, Lewis A., 4,613,468, Cl. 260-550.000.

GTE Products Corporation: *See—*
Bay, David L., 4,613,796, Cl. 315-219.000.
Cheney, Richard F.; and Pierce, Richard H., 4,613,371, Cl. 75-255.000.
Chenot, Charles F., 4,613,453, Cl. 252-301.60P.

Guay, Roger G. Robotic head with interchangeable fingertips. 4,613,277, Cl. 414-729.000.

Gude, Armin: *See—*
Michel, Klaus; and Gude, Armin, 4,613,532, Cl. 428-36.000.

Gueremy, Claude G. A.; Mestre, Michel A. P.; and Renault, Christian L. A., to Pharmuka Laboratoires. Medicaments based on derivatives of 1-(4-quinolyl)-2-(4-piperidyl)-ethanol or 1-(4-quinolyl)-3-(4-piperidyl)-propanol. 4,613,607, Cl. 514-314.000.

Guerreri, Bart G.: *See—*
Kasevich, Raymond S.; Dwyer, Arthur S.; and Guerreri, Bart G., 4,612,940, Cl. 128-804.000.

Guitian, Jose: *See—*
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.

Gundy, William P., to NPC Systems, Inc. Mechanical centering apparatus and method. 4,612,730, Cl. 51-3.000.

Gunnerman, Rudolf W.; and Farone, William A. Process for preparing and using sweet sorghum in a fuel product. 4,613,339, Cl. 44-1.00D.

Gunter, Wolfgang; and Nespoli, Guido, to Exxon Research & Engineering Co. Dielectric fluid. 4,613,923, Cl. 361-315.000.

Haack, John L.; and Mohr, Paul H., to Union Carbide Corporation. Organophosphate-containing antifreeze. 4,613,445, Cl. 252-75.000.

Haas, Gerhard J.: *See—*
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,613,507, Cl. 426-28.000.

Haavik, Harold K., to Nash Engineering Company, The. Liquid ring compressors. 4,613,283, Cl. 417-68.000.

Haeberle, Russell J.: *See—*
Esper, Michael J.; Haeberle, Russell J.; and Winegar, Brian G., 4,613,843, Cl. 336-232.000.

Hagans, Patrick L.: *See—*
Yates, Ronald L.; and Hagans, Patrick L., 4,613,386, Cl. 148-13.000.

Hagelthorn, George A. Apparatus for adjusting and retaining bearings on an axle. 4,613,240, Cl. 384-585.000.

Hagiwara, Tokio: *See—*
Narita, Tadashi; Hagiwara, Tokio; and Hamana, Hiroshi, 4,613,657, Cl. 526-204.000.

Hahn, Alfred, to Siemens Aktiengesellschaft. X-ray examination table. 4,613,121, Cl. 269-322.000.

Hair, Michael L.: *See—*
Ober, Christopher K.; Lok, Kar P.; Hair, Michael L.; and Branston, Randolph E., 4,613,559, Cl. 430-137.000.

Haken, Roger A., to Texas Instruments Incorporated. High-voltage CMOS process. 4,613,885, Cl. 357-42.000.

Haken, Roger A.: *See—*
Paterson, James L.; and Haken, Roger A., 4,613,956, Cl. 365-185.000.

Halbach, Richard E.: *See—*
Battocletti, Joseph H.; Halbach, Richard E.; Antonich, Frederick J.; Sances, Anthony, Jr.; and Knox, Thomas A., 4,613,818, Cl. 324-306.000.

Hall, George H.: *See—*
Rose, Scott J.; Huettner, Rodney J.; and Hall, George H., 4,613,294, Cl. 425-438.000.

Hallett, Peter: *See—*
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,613,597, Cl. 514-211.000.

Halliburton Company: *See—*
Brisco, David P., 4,613,161, Cl. 285-18.000.
Harris, Allen E.; and Szarka, David D., 4,613,159, Cl. 285-3.000.
Vann, Roy R.; and Brieger, Emmet F., 4,612,992, Cl. 166-297.000.

Hallmark Cards, Incorporated: *See—*
Bushyhead, Jess C.; Kolster, Harvey L.; Lowry, Michael G.; and Wolf, Fred C., 4,613,047, Cl. 211-55.000.

Hallot, Andre : *See—*
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , 4,613,603, Cl. 514-242.000.

Halls, Lawrence M.; and Wynn, Edward J., to Sperry Corporation. Combine header attitude control mechanism. 4,612,757, Cl. 56-10.200.

Halpern, Samuel W., to AT&T Bell Laboratories. Radiotelephone transmission power control. 4,613,990, Cl. 455-33.000.

Ham, Mooyoung; and Duffy, John W., to SFE Technologies. Monolithic capacitor edge termination. 4,613,518, Cl. 427-38.000.

Hamada, Shunichi: *See—*
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.

Hamada, Shunji: *See—*
Saito, Sadayuki; Hamada, Shunji; Iwamura, Tadaaki; and Takabe, Ryoji, 4,613,113, Cl. 266-83.000.

Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, to Sony Corporation. Disc player. 4,613,967, Cl. 369-221.000.

Hamana, Hiroshi: *See—*
Narita, Tadashi; Hagiwara, Tokio; and Hamana, Hiroshi, 4,613,657, Cl. 526-204.000.

Hambley, Charles C. Wave operated energy device. 4,613,287, Cl. 417-330.000.

Hamilton, William R.: *See—*
Pittman, Paul R.; Scott, Floyd L., Jr.; and Hamilton, William R., 4,613,002, Cl. 175-107.000.

Hammarskog, Bjorn, to SKF Steel Engineering, A.B. Method and means for manufacturing a preformed metal product. 4,613,364, Cl. 75-34.000.

Hanada, Toshiro: *See—*
Yamanishi, Kazuhiko; Shintani, Akinori; Okajima, Satoru; and Hanada, Toshiro, 4,613,465, Cl. 260-394.000.

Hanai, Yoshimitsu: *See—*
Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, 4,613,221, Cl. 354-321.000.
Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, 4,613,222, Cl. 354-321.000.

Handa, Tamami; and Shimizu, Eiichi, to Sharp Kabushiki Kaisha. Chain drive type carriage reciprocating device for a copying machine. 4,613,126, Cl. 271-267.000.

Handozer Industry Co., Ltd.: *See—*
Fukaya, Hiroshi; Takada, Yuji; and Tamachi, Masao, 4,612,829, Cl. 74-876.000.

Handschuh, Volkmar: *See—*
Beitzke, Bernhard; Handschuh, Volkmar; and Blank, Heinz U., 4,613,692, Cl. 562-495.000.

Hane, Toshioki: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,613,467, Cl. 260-543.00F.

Haneda, Yoshiaki: *See—*
Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, 4,613,967, Cl. 369-221.000.

Hans Stahlecker and Fritz Stahlecker: *See—*
Stahlecker, Fritz, 4,612,762, Cl. 57-301.000.

Hansen, Craig N.; and Cross, Paul C., to Hansen Engine Corporation. Internal combustion engine with rotary combustion chamber. 4,612,886, Cl. 123-190.00B.

Hansen, Donald F.; and Shubert, William K., to HSS Inc. Present weather observing system utilizing particulate size and velocity measurements. 4,613,938, Cl. 364-420.000.

Hansen Engine Corporation: *See—*
Hansen, Craig N.; and Cross, Paul C., 4,612,886, Cl. 123-190.00B.

Hansson, Bengt L.: *See—*
Nilsson, Jan-Ake I.; and Hansson, Bengt L., 4,612,865, Cl. 110-244.000.

Hara, Kazuo: *See—*
Iwanaga, Toshikazu; and Hara, Kazuo, 4,612,892, Cl. 123-438.000.

Hara, Kenji; and Eguchi, Yasuteru, to KAO Corporation. Composition for cleansing and wiping the circumanal region. 4,613,447, Cl. 252-91.000.

Hara, Yukihiko, to Mitsu Norin Co., Ltd. Process for the production of tea catechins. 4,613,672, Cl. 549-399.000.

Harada Kogyo Kabushiki Kaisha: *See—*
Harada, Takuji, 4,613,833, Cl. 333-24.00R.

Harada, Koichi: *See—*
Sekiya, Masayoshi; and Harada, Koichi, 4,613,633, Cl. 523-201.000.

Harada, Takuji, to Harada Kogyo Kabushiki Kaisha. Transmission channel coupler for antenna. 4,613,833, Cl. 333-24.00R.

Harada, Toyohei; and Tao, Muneo, to Matsushita Electric Industrial Co., Ltd. Oil burner. 4,613,298, Cl. 431-88.000.

Harara, Mitsuhiko: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake. 4,613,154, Cl. 280-707.000.

Hardtke, Hans-Herlof, to LISEGA Kraftwerkstechnik GmbH. Suspension device with a compensatory spring system. 4,613,119, Cl. 267-172.000.

Hargis, Duane C., to Ethyl Corporation. Catalytic alkylation of aromatic amines with alkanols. 4,613,705, Cl. 564-409.000.

Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., to Allied Corporation. Complex composite article having improved impact resistance. 4,613,535, Cl. 428-113.000.

Harrel, Incorporated: *See*—
Harris, Holton E., 4,613,471, Cl. 264-40.100.

Harris, Allen E.; and Szarka, David D., to Halliburton Company. Pressure-assisted dynamic seal apparatus. 4,613,159, Cl. 285-3.000.

Harris Corporation: *See*—
Cox, Eugene R., 4,612,701, Cl. 29-576.00W.
Young, W. Ronald, 4,613,772, Cl. 307-443.000.

Harris, Holton E., to Harrel, Incorporated. Extruded plastic foam density control system and method. 4,613,471, Cl. 264-40.100.

Harris, James E.: *See*—
Robeson, Lloyd M.; Harris, James E.; and Michno, Michael J., Jr., 4,613,645, Cl. 524-443.000.

Hart, James E.; Mong, William K.; Kyllonen, Allen W.; and Krampitz, Mark S., to American Standard Inc. Single-cylinder truck-mounted brake assembly. 4,613,016, Cl. 188-52.000.

Hartman, Nile F., to Ford Motor Company. Heads-up display system with holographic dispersion correcting. 4,613,200, Cl. 350-3.700.

Harumoto Iron Works Co., Ltd.: *See*—
Daiguji, Hisashi, 4,612,680, Cl. 14-22.000.

Haruta, Etsuro: *See*—
Nakajima, Motoharu; Sakane, Seishiro; Sato, Norimichi; and Haruta, Etsuro, 4,612,734, Cl. 51-170.0PT.

Hasegawa, Kazumi, to Isowa Industry Company, Ltd. Apparatus for bonding a printing plate on a base film. 4,613,395, Cl. 156-378.000.

Hasegawa, Kiyoshi; Matsuo, Hisashi; and Hashimoto, Hideki, to Kabushiki Kaisha Kobe Seiko Sho. Industrial robot and a method for positioning same. 4,613,803, Cl. 318-568.000.

Hasegawa, Takahisa: *See*—
Sugiura, Takayuki; and Hasegawa, Takahisa, 4,612,889, Cl. 123-339.000.

Hashimoto, Hideki: *See*—
Hasegawa, Kiyoshi; Matsuo, Hisashi; and Hashimoto, Hideki, 4,613,803, Cl. 318-568.000.

Hashimoto, Hiroshi: *See*—
Tate, Susumu; Hashimoto, Hiroshi; and Chiba, Akira, 4,613,664, Cl. 528-274.000.

Hashimoto, Kenji, to Kenji, Yabumoto, a part interest. Underwear and method of making same. 4,612,674, Cl. 2-406.000.

Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Electronic translator having removable data memory and controller both connectable to any one of terminals. 4,613,944, Cl. 364-513.500.

Hashimoto, Shintaro; and Yoshida, Hideo, to Sharp Kabushiki Kaisha. Speech synthesizer with function of developing melodies. 4,613,985, Cl. 381-51.000.

Hashimoto, Toshihiko: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.

Hashimoto, Toshio: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,613,585, Cl. 502-355.000.

Hashimoto, Yasuhiro: *See*—
Miyake, Norihisa; Tsuchihashi, Akira; Fujiwara, Osamu; Hashimoto, Yasuhiro; and Maruyama, Yutaka, 4,613,943, Cl. 364-513.000.

Hashimoto, Yoshinobu: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.

Haskell, Donald M., to Phillips Petroleum Company. Oxygen addition to a steam-active dehydrogenation reactor. 4,613,715, Cl. 585-412.000.

Hata, Go: *See*—
Naruto, Masanobu; Kondo, Hisao; and Hata, Go, 4,613,680, Cl. 560-205.000.

Hatayama, Kazumi: *See*—
Masuda, Ikuro; Maejima, Hideo; Hayashi, Terumine; and Hatayama, Kazumi, 4,613,970, Cl. 371-25.000.

Hatton, James R. Mobile ice plant. 4,612,779, Cl. 62-344.000.

Hattori, Katsura. Replaceable blade type medical scissors. 4,612,708, Cl. 30-260.000.

Haubennestel, Karlheinz; and Bubat, Alfred, to BYK-Chemie GmbH. Coating and molding compositions with spreadability improving and lubricity increasing siloxanes and use of such siloxanes as coating and molding composition additives. 4,613,641, Cl. 524-267.000.

Haugen, David M.: *See*—
Rubbo, Richard P.; and Haugen, David M., 4,612,985, Cl. 166-114.000.

Haun, Michael J.; Newnham, Robert E.; and Schulze, Walter A., to United States of America, Navy. Transversely reinforced piezoelectric composites. 4,613,784, Cl. 310-358.000.

Hausler, Dietrich; and Schwarz, Horst, to Thyssen Industrie Aktiengesellschaft. Arrangement for reinforcing and spacing annular disks of a hammer rotor. 4,613,088, Cl. 241-197.000.

Haussecker, Klaus: *See*—
Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, 4,613,203, Cl. 350-6.600.

Hayashi, Katsumi: *See*—
Dorer, Casper J., Jr.; and Hayashi, Katsumi, 4,613,342, Cl. 44-62.000.

Hayashi, Osamu: *See*—
Okahashi, Kazuo; Hayashi, Osamu; Ishii, Isao; and Kobayashi, Toshiyuki, 4,613,167, Cl. 285-54.000.

Hayashi, Terumine: *See*—
Masuda, Ikuro; Maejima, Hideo; Hayashi, Terumine; and Hatayama, Kazumi, 4,613,970, Cl. 371-25.000.

Hayashi, Toshihiko; and Matsuzaki, Yoshitomi, to Nissan Motor Co., Ltd. Drain device of automotive radiator. 4,612,977, Cl. 165-71.000.

Hayashi, Tsutomu: *See*—
Ohzono, Kohei; and Hayashi, Tsutomu, 4,613,026, Cl. 192-85.0AA.

Hayes, Norman F.: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,613,597, Cl. 514-211.000.

Hayes, Norman J.; and Shaw, Richard J. Multiple purpose animal ear tag system. 4,612,877, Cl. 119-156.000.

Hayes, Robert J.; and Mahl, Ronald M., to Emerson Electric Co. Thread cutting die head for power driven threading machines. 4,613,260, Cl. 408-74.000.

Haythornthwaite, James. Tennis racquet with flexible membrane frame. 4,613,138, Cl. 273-73.00E.

Hazato, Tadahiko: *See*—
Katayama, Takashi; and Hazato, Tadahiko, 4,613,588, Cl. 514-23.000.

Hazell, Quinton: *See*—
Bellamy, John S.; and Elliott, Keith D., 4,613,251, Cl. 403-135.000.

Head, Donald L.: *See*—
Nelson, Erik K.; and Head, Donald L., 4,613,742, Cl. 219-121.0LG.

Health Products Development, Inc.: *See*—
Chavkin, Leonard, 4,613,497, Cl. 424-44.000.

Hebard, Harry D.: *See*—
Smith, Roger, Jr.; Priest, Joseph R.; Langowski, Faustyn C.; and Hebard, Harry D., 4,613,849, Cl. 340-679.000.

Heeb, Bruce E.: *See*—
Eggers, Frederick W.; Graham, Paul D.; and Heeb, Bruce E., 4,613,797, Cl. 315-241.00R.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Process for allylating hydroxyaromatic compounds. 4,613,703, Cl. 568-640.000.

Heidelberger Druckmaschinen AG: *See*—
Jeschke, Willi, 4,613,125, Cl. 271-227.000.

Heilala, Antti-Jussi, to Oy Safematic Ltd. Slide-ring seal with distortion prevention construction. 4,613,142, Cl. 277-81.00R.

Heine, Wilfried, to Ant Nachrichtentechnik GmbH. Microwave slot line ring hybrid having arms which are HF coupled to the slot line ring. 4,613,834, Cl. 333-120.000.

Heinen, Manfred, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Hydrostatic and hydrodynamic seal for rotating a rotating shaft. 4,613,141, Cl. 277-27.000.

Heitman, Christopher J.; and Schwehr, Gregory D., to General Electric Company. Fiber optic illuminating assembly. 4,613,926, Cl. 362-32.000.

Heitzig, Claus-Peter, to Siemens Aktiengesellschaft. Apparatus for the cooling of electronic assemblies or components. 4,612,979, Cl. 165-129.000.

Held, Manfred; Leidig, Alfred; Merl, Wilhelm A.; and Stempel, Gunter, to Messerschmitt-Bolkow Blohm GmbH; and Bayerische Metallwerke GmbH. Hollow charge, or plate charge, lining and method of forming a lining. 4,613,370, Cl. 75-248.000.

Hellbach, Hans: *See*—
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Hellbach, Hans, 4,613,466, Cl. 560-344.000.

Hellquist, Andrew V.: *See*—
Sewerinson, Ake; and Hellquist, Andrew V., 4,613,976, Cl. 375-52.000.

Helmerson, Rickard: *See*—
Edberg, Nils; Kores, Ivar; Holmkvist, Gottfrid; and Helmerson, Rickard, 4,613,001, Cl. 175-52.000.

Hendricks, Udo W.; Lesche, Klaus; Sackmann, Gunter; and Schroer, Wolf-Dieter, to Bayer Aktiengesellschaft. Process for dyeing cellulose-containing fibre materials by the cold pad-batch or pad-steam method: maleic anhydride-styrene copolymer. 4,613,337, Cl. 8-543.000.

Hendrix, James E.; Daniels, John Y.; and White, Taryn M., to Springs Industries, Inc. Silicone durable press textile treatment process and resulting product. 4,613,333, Cl. 8-115.700.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Blosl, Siegfried; Bruns, Klaus; and Schaper, Ulf-Armin, 4,613,457, Cl. 252-522.00R.
Meyer, Klaus; and vom Hofe, Dieter, 4,613,064, Cl. 222-456.000.
Moeller, Hinrich; and Wallat, Siegfried, 4,613,622, Cl. 514-718.000.

Henn, Stefan; and Flammann, Norbert, to Robert Krups Stiftung & Co. KG. Adjustable slicing machine for bread and other types of foodstuffs. 4,612,836, Cl. 83-729.000.
Henrich, Gunter; Hoffmann, Harald; Waldhecker, Heinz-Dieter; and Mey, Klaus-Peter, to Klockner-Humboldt-Deutz AG. Method and apparatus for cleaning hot gases produced during a coal gasification process. 4,613,344, Cl. 48-77.000.
Hensel, Joseph D.: *See—*
Traut, G. Robert; Keahey, Frank S., Jr.; Kozakoff, Dennis J.; Bethea, Paul M.; and Hensel, Joseph D., 4,613,540, Cl. 428-212.000.
Henson, James H. Apparatus for controlling water level. 4,612,949, Cl. 137-2.000.
Hentschel, Volker, to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann. Apparatus for setting and removing tunnel casing rings. 4,613,258, Cl. 405-303.000.
Herbec, Jean-Pierre; Laisney, Michel; Murat, Jacques; and Serpeau, Patrick, to L'Etat Francais. Device for observation through a wall in two opposite directions. 4,613,216, Cl. 350-618.000.
Hercules Incorporated: *See—*
Bither, Peter G., 4,613,635, Cl. 524-14.000.
Dasgupta, Sunil P., 4,613,520, Cl. 427-128.000.
Herden, Werner; and Bloss, Werner, to Robert Bosch GmbH. Spark plug with capacitor spark discharge. 4,613,789, Cl. 315-58.000.
Herlin, Robert M.; and Sutton, Richard W., to Graphics 3 Inc. Polyhedron assembling machine and method. 4,613,391, Cl. 156-213.000.
Herman, Edwin B.: *See—*
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,613,507, Cl. 426-28.000.
Hermann Heye: *See—*
Krumme, Manfred; and Geisel, Gerhard, 4,613,352, Cl. 65-158.000.
Hermes, Robert E.: *See—*
Mathias, Lon J.; and Hermes, Robert E., 4,613,658, Cl. 526-312.000.
Herndon, Gerald F., to Boeing Company, The. Apparatus for repositioning aircraft ejection seat during the ejection sequence and method. 4,613,101, Cl. 244-122.00R.
Hertzenberg, Elliot P., to PQ Corporation. Porous zeolite granules stable in aqueous solutions. 4,613,578, Cl. 502-64.000.
Hess, Norbert: *See—*
Salanki, Tibor; and Hess, Norbert, 4,613,727, Cl. 174-30.000.
Hesse, Joseph F.: *See—*
Person, Herman R.; Hesse, Joseph F.; and Raysby, Keith T., 4,613,855, Cl. 340-718.000.
Hettinga, Siebolt. Clamping structure and method for clamping the mold unit of a mold injection apparatus. 4,613,475, Cl. 264-328.100.
Heuer, Werner: *See—*
Drechsler, Klaus D.; Heuer, Werner; and Tiebel, Rainer, 4,613,751, Cl. 250-223.00R.
Heurich, Gunther: *See—*
Hofmann, Heinrich; and Heurich, Gunther, 4,613,239, Cl. 384-580.000.
Hewlett-Packard Company: *See—*
Chu, David C., 4,613,951, Cl. 364-569.000.
Kible, Dieter, 4,613,777, Cl. 307-591.000.
Heynisch, Hinrich: *See—*
Brumme, Gerhard; Grage, Ludger; Heynisch, Hinrich; and Hubner, Erwin, 4,613,971, Cl. 372-87.000.
Hibi, Yasuo; Shibata, Tadahiko; and Iwase, Takatoshi, to Nippondenso Co., Ltd. Apparatus for conveying corrugated members. 4,613,034, Cl. 198-465.100.
Higashi, Hidehiro; Shirono, Katsuhiro; Arima, Yuusaku; Nishimura, Yoichi; and Yoshida, Shinichi, to Catalysts & Chemicals Industries Co., Ltd. Process for hydrotreating heavy hydrocarbon oils. 4,613,425, Cl. 208-89.000.
Higgins, Robert G., to Midland-Ross Corporation. Trench duct and cover assembly. 4,612,746, Cl. 52-221.000.
Higuchi, Shigemitsu; Konno, Kazutoshi; and Sampei, Tohru, to Hitachi, Ltd. Magnetic head for magnetic disk. 4,613,920, Cl. 360-121.000.
Higuchi, Tetsuya: *See—*
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.
Hikishima, Keisaku: *See—*
Irikura, Koji; Hikishima, Keisaku; and Fujisaki, Koichiro, 4,613,024, Cl. 192-18.00A.
Hill, Fred W.: *See—*
Gentile, Anthony L.; Kyle, Nanse R.; and Hill, Fred W., 4,613,495, Cl. 423-508.000.
Hines, James H., to Tap-Rite Products Corp. Remote pressure-indicating means. 4,613,851, Cl. 340-688.000.
Hinkley, David; and Pann, Keh, to Mobil Oil Corporation. Method for constructing and using an optimal pilot trace in surface consistent statics estimations. 4,613,960, Cl. 367-51.000.
Hinotozawa, Kiyoizumi: *See—*
Omura, Satoshi; Tanaka, Haruo; Hinotozawa, Kiyoizumi; Murata, Masatsune; and Iwai, Yuzuru, 4,613,355, Cl. 71-86.000.
Hirabayashi, Akinori: *See—*
Yabu, Hisao; Tsuji, Kenji; and Hirabayashi, Akinori, 4,613,840, Cl. 335-128.000.
Hirai, Yutaka: *See—*
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,613,558, Cl. 430-84.000.
Hiraiwa, Kazuyoshi; and Muraoka, Akihiko, to Nissan Motor Co., Ltd. 2WD-4WD change-over control system responsive to rainfall and acceleration. 4,613,008, Cl. 180-247.000.
Hirano, Hiroyuki, to Pioneer Electronic Corporation. Tracking-servo device. 4,613,963, Cl. 369-44.000.
Hirano, Takao: *See—*
Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, 4,613,666, Cl. 544-277.000.
Hirosaki, Botaro: *See—*
Aoyagi, Hidehito; and Hirosaki, Botaro, 4,613,975, Cl. 375-40.000.
Hirosawa, Hideki: *See—*
Masuko, Akinori; Kuroiwa, Wataru; Shimizu, Yasufumi; and Hirosawa, Hideki, 4,613,826, Cl. 331-14.000.
Hitachi Electronics Engineering Co., Ltd.: *See—*
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.
Hitachi Koki Company, Ltd.: *See—*
Okada, Kunihiro; Endo, Hirohide; and Saito, Susumu, 4,613,753, Cl. 250-236.000.
Hitachi, Ltd.: *See—*
Abe, Osamu; and Sugiura, Noboru, 4,612,902, Cl. 123-425.000.
Higuchi, Shigemitsu; Konno, Kazutoshi; and Sampei, Tohru, 4,613,920, Cl. 360-121.000.
Katayama, Yoshifumi; Shimada, Toshikazu; and Maruyama, Eiichi, 4,613,382, Cl. 148-1.500.
Kuroiwa, Hiroshi; Nishimura, Yutaka; and Oyama, Yoshishige, 4,612,895, Cl. 123-494.000.
Masuda, Ikuro; Maejima, Hideo; Hayashi, Terumine; and Hatayama, Kazumi, 4,613,970, Cl. 371-25.000.
Miyake, Norihisa; Tsuchihashi, Akira; Fujiwara, Osamu; Hashimoto, Yasuhiro; and Maruyama, Yutaka, 4,613,943, Cl. 364-513.000.
Mori, Kenji; and Ogiso, Toshio, 4,613,782, Cl. 310-323.000.
Okada, Kunihiro; Endo, Hirohide; and Saito, Susumu, 4,613,753, Cl. 250-236.000.
Sato, Eiji; Fukuda, Tamio; Ishii, Masaharu; Nakamura, Mitsuru; and Nakamura, Yozo, 4,613,285, Cl. 417-214.000.
Shibata, Akira; Yoshioka, Atsushi; and Watanabe, Katsuyuki, 4,613,912, Cl. 360-19.100.
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.
Yanadori, Michio; Kawano, Tomohiro; Miyamoto, Seigo; Nara, Yasuaki; and Oguri, Masahiro, 4,612,974, Cl. 165-10.000.
Hitachi Microcomputer Hitachi, Ltd.: *See—*
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.
Hixson, Marvin D.: *See—*
Racine, Bill A.; Hixson, Marvin D.; and Huber, Gene A., 4,613,432, Cl. 209-254.000.
Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann: *See—*
Hentschel, Volker, 4,613,258, Cl. 405-303.000.
Hoechst Aktiengesellschaft: *See—*
Arndt, Otto; and Papenfuhs, Theodor, 4,613,698, Cl. 564-412.000.
Kau, Heinz; and Russow, Jurgen, 4,613,416, Cl. 204-98.000.
Krohn, Karsten; and Behnke, Bert, 4,613,464, Cl. 260-384.000.
Papenfuhs, Theodor, 4,613,704, Cl. 564-418.000.
Hoenig, Eckhardt, to Siemens Aktiengesellschaft. Superconducting gradiometer coil system for an apparatus for the multi-channel measurement of weak nonstationary magnetic fields. 4,613,817, Cl. 324-248.000.
Hofer, Robert: *See—*
Steiger, Anton; and Hofer, Robert, 4,612,898, Cl. 123-299.000.
Hoffman, Leonard J., to ITT Corporation. Radiation source identification system. 4,613,865, Cl. 343-417.000.
Hoffmann, Harald: *See—*
Henrich, Gunter; Hoffmann, Harald; Waldhecker, Heinz-Dieter; and Mey, Klaus-Peter, 4,613,344, Cl. 48-77.000.
Hoffmann-La Roche Inc.: *See—*
Baggiolini, Enrico; Pizzolato, Giacomo; Uskokovic, Milan; and Truitt, Gary, 4,613,594, Cl. 514-167.000.
Boller, Arthur; Germann, Alfred; Petrzilka, Martin; and Schadt, Martin, 4,613,208, Cl. 350-349.000.
Hofgen, Gunter, to International Standard Electric Corporation. Position-fixing system. 4,613,864, Cl. 343-357.000.
Hofmann, Heinrich; and Heurich, Gunther, to FAG Kugelfischer Georg Schafer (KGaA). Solid window cage for cylindrical roller bearing. 4,613,239, Cl. 384-580.000.
Hofmann, Manfred: *See—*
Andra , Rainer; and Hofmann, Manfred, 4,613,117, Cl. 267-140.100.
Hokko Chemical Industry Co., Ltd.: *See—*
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.
Holac Maschinenbau GmbH: *See—*
Holz, Ernst, 4,612,682, Cl. 17-26.000.
Holz, Ernst, 4,612,683, Cl. 17-26.000.
Holcombe, Edward L.: *See—*
Reid, Philip L.; and Holcombe, Edward L., 4,613,043, Cl. 206-428.000.

Holland, David G.; and Banks, Peter B., to English Electric Valve Company Limited. Image intensifiers and method of producing same. 4,613,786, Cl. 313-528.000.
Holland, Varnum S., to Unitrode Corporation. Low forward-voltage drop SCR. 4,613,767, Cl. 307-288.000.
Holmes, Benny J.: *See*—
Terrell, Jamie B.; and Holmes, Benny J., 4,613,394, Cl. 156-345.000.
Holmes, William A. Disk memory apparatus. 4,613,921, Cl. 360-133.000.
Holmkvist, Gottfrid: *See*—
Edberg, Nils; Kores, Ivar; Holmkvist, Gottfrid; and Helmerson, Rickard, 4,613,001, Cl. 175-52.000.
Holmstrom, Sven A.: *See*—
Berg, Hans G.; Holmstrom, Sven A.; and Johansson, Leif, 4,613,365, Cl. 75-83.000.
Holz, Ernst, to Holac Maschinenbau GmbH. Apparatus for treating meat. 4,612,682, Cl. 17-26.000.
Holz, Ernst, to Holac Maschinenbau GmbH. Apparatus for pressure-treating meat. 4,612,683, Cl. 17-26.000.
Holz, George E.; and Ogle, James A., to Burroughs Corporation. System for operating a dot matrix display panel to prevent crosstalk. 4,613,854, Cl. 340-714.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ajiki, Yoshio; and Kajiwara, Shigemasa, 4,612,884, Cl. 123-90.160.
Furukawa, Yoshimi, 4,613,144, Cl. 280-91.000.
Morita, Isamu, 4,613,118, Cl. 267-140.100.
Nakamura, Kenji; and Miura, Tatsuhiko, 4,613,009, Cl. 180-253.000.
Nishimura, Sadanori, 4,613,022, Cl. 192-3.290.
Ohzono, Kohei; and Hayashi, Tsutomu, 4,613,026, Cl. 192-85.0AA.
Honda Motor Co., Ltd.: *See*—
Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, 4,613,791, Cl. 315-82.000.
Honeywell Inc.: *See*—
Doddapaneni, Narayan, 4,613,551, Cl. 429-194.000.
Honeywell Information Systems Italia: *See*—
Rossi, Mario; and Gaboardi, Angelo, 4,613,243, Cl. 400-124.000.
Honig, Emanuel M., to United States of America, Energy. Series-counterpulse repetitive-pulse inductive storage circuit. 4,613,765, Cl. 307-252.00K.
Honjo, Takeshi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,613,227, Cl. 355-14.00C.
Honjoh, Yoshihisa; and Okuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus. 4,612,899, Cl. 123-413.000.
Hood, Thomas G.; Vincent, Steve M.; and Mellentin, Stephen W., to Southwall Technologies, Inc. Multiple pane glass unit with electrically conductive transparent film for use as radiation shield. 4,613,530, Cl. 428-34.000.
Hoover, Ralph H.: *See*—
Schnurer, John W., 4,612,878, Cl. 122-15.000.
Hori, Hiroshi; Taniyama, Kiyoshi; and Huruhata, Katumi, to Toyota Jidosha Kabushiki Kaisha. Lubricating structure of differential carrier for vehicle. 4,612,818, Cl. 74-467.000.
Hori, Katsuya; and Furuya, Tsuneo, to Sony Corporation. Digital audio disc system. 4,613,965, Cl. 369-59.000.
Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Method for doping tin oxide. 4,613,539, Cl. 428-210.000.
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., to Mobil Oil Corporation. N-alkoxyalkylenediamine [organic acid reaction products] diamides and lubricants containing same. 4,613,343, Cl. 44-71.000.
Horowitz, Bernard, to New York Blood Center, Inc. Inactivation of viruses in labile blood derivatives. 4,613,501, Cl. 424-89.000.
Horrmann, Wilhelm. Fatty aldehydes and acids in the treatment of neurological and inflammatory diseases. 4,613,621, Cl. 514-693.000.
Hosemann, Gerhard, to Siemens Aktiengesellschaft. Low-noise system for measuring frequency in multiphase power transmission systems. 4,613,807, Cl. 318-807.000.
Hoshino, Eiichi, to Fujitsu Limited. Method for dry etching a chromium or chromium oxide film. 4,613,401, Cl. 156-643.000.
Hoshino, Yutaka; Kataoka, Koji; and Asanaka, Yasumasa, to Ferro Enamels (Japan) Limited. Resin composition for closed-cell foam and cured resin foam prepared by using said resin composition. 4,613,628, Cl. 521-72.000.
Hosogoe, Junichi; Ida, Yuichi; and Suzuki, Motoyuki, to Alps Electric Co., Ltd. X-Y Input device. 4,613,853, Cl. 340-710.000.
Hosoya, Eikichi: *See*—
Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,613,591, Cl. 514-34.000.
Hough, Jack V. D.; Richard, Gordon L.; Barton, Kenneth E., Jr.; DiCarlo, Paul; and Chow, Robert Y., to Xomed, Inc. Direct bone conduction hearing aid device. 4,612,915, Cl. 128-1.00R.
Houghton, Alan N.: *See*—
Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., 4,613,576, Cl. 436-548.000.
Hovde, Oskar. Board floors. 4,612,745, Cl. 52-220.000.
Howard, William A. Fuel producing apparatus using waste products. 4,613,408, Cl. 202-84.000.
Howmet Turbine Components Corporation: *See*—
Burd, Lamar; Miller, Evan R.; Carozza, Eugene J.; and Grunstra, Robert E., 4,612,969, Cl. 164-122.200.
HSS Inc.: *See*—
Hansen, Donald F.; and Shubert, William K., 4,613,938, Cl. 364-420.000.
Hsu, Chao-Yang; and Ellis, Paul E., Jr., to Sun Refining and Marketing Company. Process for the production and purification of diethoxymethane by azeotropic distillation. 4,613,411, Cl. 203-67.000.
HTS-Elektrotechnik GmbH: *See*—
Schmidt, Dieter, 4,612,794, Cl. 72-410.000.
Huang, Shyh-Chin: *See*—
Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., 4,613,368, Cl. 75-246.000.
Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., 4,613,480, Cl. 419-30.000.
Huber, Gene A.: *See*—
Racine, Bill A.; Hixson, Marvin D.; and Huber, Gene A., 4,613,432, Cl. 209-254.000.
Hubner, Erwin: *See*—
Brumme, Gerhard; Grage, Ludger; Heynisch, Hinrich; and Hubner, Erwin, 4,613,971, Cl. 372-87.000.
Huchette, Michel; Fleche, Guy; and Gosset, Serge, to Roquette Freres. Cationic additive for the manufacture of paper. 4,613,407, Cl. 162-175.000.
Huckler, Volker: *See*—
Benedek, Vasile; Huckler, Volker; and Ortlepp, Hilmar S., 4,612,995, Cl. 172-7.000.
Hudgens, Jeffrey W., to United States of America, Navy. Method of mass spectrometry. 4,613,755, Cl. 250-282.000.
Huettner, Rodney J.: *See*—
Rose, Scott J.; Huettner, Rodney J.; and Hall, George H., 4,613,294, Cl. 425-438.000.
Hughes Aircraft Company: *See*—
Ajioka, James S.; and Strahan, James V., 4,613,869, Cl. 343-768.000.
Gentile, Anthony L.; Kyle, Nanse R.; and Hill, Fred W., 4,613,495, Cl. 423-508.000.
Landis, Abraham L.; and Naselow, Arthur B., 4,613,637, Cl. 524-105.000.
Hughes, David W., to Vetco Offshore Industries, Inc. Misalignment tieback tool - non-rotating casing. 4,613,162, Cl. 285-27.000.
Hughes, David W.; and Milberger, Lionel J., to Vetco Offshore Industries, Inc. Misalignment tieback tool - rotating casing. 4,613,164, Cl. 285-27.000.
Hughes Tool Company: *See*—
Pittman, Paul R.; Scott, Floyd L., Jr.; and Hamilton, William R., 4,613,002, Cl. 175-107.000.
Smith, Roger, Jr.; Priest, Joseph R.; Langowski, Faustyn C.; and Hebard, Harry D., 4,613,849, Cl. 340-679.000.
Hughes Tool Company - USA: *See*—
Shotwell, Duane E., 4,613,004, Cl. 175-371.000.
Hugues, Francois: *See*—
Chauvin, Yves; Commereuc, Dominique; Cruypelinck, Daniel; Hugues, Francois; and Vidouta, Georges, 4,613,726, Cl. 585-861.000.
Huizinga, Tom: *See*—
Van Erp, Willibrord A.; Seelen-Kruijssen, Josepha M. E.; and Huizinga, Tom, 4,613,488, Cl. 423-328.000.
Humphreys & Glasgow, Ltd.: *See*—
Winter, Christopher L., 4,613,492, Cl. 423-359.000.
Hunter, James D.: *See*—
Willis, William R.; Hunter, James D.; and Lewis, Max L., 4,613,303, Cl. 431-346.000.
Huppe, Reinhard; Kaufer, Helmut; and Lemke, Hans J., to U.S. Philips Corporation. Molding apparatus with sensor means. 4,613,295, Cl. 425-542.000.
Huruhata, Katumi: *See*—
Hori, Hiroshi; Taniyama, Kiyoshi; and Huruhata, Katumi, 4,612,818, Cl. 74-467.000.
Hussein, Mamoun M., to Nabisco Brands, Inc. Essential oils treatment to remove harsh notes therefrom. 4,613,513, Cl. 426-651.000.
Hyzak, Daniel L.; and Gray, Reed A., to Stauffer Chemical Co. Herbicide compositions of extended soil life. 4,613,358, Cl. 71-100.000.
Iato, Michel: *See*—
Castel, Yvon; and Iato, Michel, 4,612,994, Cl. 166-344.000.
Ichikawa, Izumi; and Sato, Hideaki, to Canon Kabushiki Kaisha. Optical information processing method and apparatus therefor. 4,613,964, Cl. 369-45.000.
Ichikawa, Yoshiyasu, to Ogura Jewel Industry Co., Ltd. Guide holders of electrodischarge machining apparatus having wire electrode. 4,613,740, Cl. 219-69.00W.
Ichinoi, Yutaka, to Victor Company of Japan, Limited. Video noise reduction circuit having improved transient characteristics. 4,613,905, Cl. 358-167.000.
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Ohya, Yoshihiro, to Nippon Steel Corporation. Iron core for electrical machinery and apparatus as well as method for producing the iron core. 4,613,842, Cl. 336-218.000.
ICI Americas Inc.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,613,638, Cl. 524-109.000.
ICU Intercommerz Union S.A.: *See*—
Marchesini, Sisto, 4,613,185, Cl. 297-39.000.
Ida, Yuichi: *See*—
Hosogoe, Junichi; Ida, Yuichi; and Suzuki, Motoyuki, 4,613,853, Cl. 340-710.000.
Ide, Kohei: *See*—
Kimura, Tetsuro; and Ide, Kohei, 4,613,053, Cl. 220-22.000.
Ide, Tohru; and Okamura, Minoru, to Fuji Jukogyo Kabushiki Kaisha. Control system for an infinitely variable transmission. 4,612,828, Cl. 74-866.000.
Igaki, Tetsuo: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, 4,613,879, Cl. 346-209.000.

Iino, Kimio: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.
Iiyama, Kiyotaka: *See*—
Inaba, Norihiko; and Iiyama, Kiyotaka, 4,613,878, Cl. 346-204.000.
Ikari, Kyoichiro: *See*—
Moritani, Tohei; and Ikari, Kyoichiro, 4,613,644, Cl. 524-430.000.
Ikari, Masanori, to Kabushiki Kaisha Komatsu Seisakusho. Air conditioning device installed in a cabin of an earth-moving vehicle. 4,612,975, Cl. 165-43.000.
Ikeda, Yoshiaki; Tamura, Yoshio; Nanri, Masahiko; and Onizuka, Yasuki, to Seikosha Co., Ltd. Device for controlling the carriage return of a lead screw driven printing head. 4,613,245, Cl. 400-313.000.
Ilchenko, Ljudmila P.: *See*—
Konischev, Alexandr I.; Arestov, Vasily P.; Baburin, Vasily I.; and Ilchenko, Ljudmila P., 4,612,849, Cl. 99-277.100.
Iler, Bobby C.: *See*—
Gretsch, Fred W.; Cook, Roy D.; and Iler, Bobby C., 4,612,840, Cl. 84-269.000.
Ilios Corporation of Japan: *See*—
Mori, Hiroki, 4,612,913, Cl. 126-438.000.
Imai, Hirosuke: *See*—
Matsuno, Mitsuo; Yamanashi, Teraki; Yuasa, Hitoshi; and Imai, Hirosuke, 4,613,456, Cl. 252-522.00R.
Imai, Masafumi: *See*—
Furuhashi, Hiroyuki; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,613,579, Cl. 502-115.000.
Imai, Yuji, to Olympus Optical Co., Ltd. Focus detection apparatus employing image height correction. 4,613,748, Cl. 250-201.000.
Imazu, Keinosuke: *See*—
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; Imazu, Keinosuke; and Tomioka, Hidehiro, 4,613,830, Cl. 331-65.000.
Imperial Chemical Industries PLC: *See*—
Cattanach, James B.; and Jones, Anthony E., 4,613,393, Cl. 156-323.000.
John, Glyn R., 4,613,384, Cl. 148-6.14R.
Owen, David J., 4,613,075, Cl. 239-3.000.
Ina, Katsuhiro: *See*—
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, 4,612,894, Cl. 123-494.000.
Inaba, Naomi: *See*—
Maruyama, Kouji; Nomura, Takeshi; Ueno, Hiroshi; and Inaba, Naomi, 4,613,581, Cl. 502-127.000.
Inaba, Norihiko; and Iiyama, Kiyotaka, to Ricoh Company, Ltd. Two-color thermosensitive recording material. 4,613,878, Cl. 346-204.000.
Incerti, Giovanni: *See*—
Franchetti, Ilario; Grisoni, Lino; Garifo, Luciano; Incerti, Giovanni; and Fantini, Vincenzo, 4,613,206, Cl. 350-174.000.
Indal Technologies Inc.: *See*—
Wood, Charles F., 4,613,282, Cl. 416-36.000.
Industrie-Entwicklungen Krupper: *See*—
Krupper, Gunther, 4,613,537, Cl. 428-192.000.
Ing, Harry; and Birnboim, Hyman C., to Canadian Patents and Development Limited. Direct reading detector/dosimeter for neutrons and other high LET radiation. 4,613,758, Cl. 250-474.100.
Ingenior F. Selmar A/S: *See*—
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, 4,613,252, Cl. 405-76.000.
Inoue, Chozo; Kurima, Yoshiko; and Moriguchi, Soyao, to Showa Denko Kabushiki Kaisha. Optical resolution process for DL-cysteine. 4,613,688, Cl. 562-401.000.
Inoue, Shinya: *See*—
Fukami, Harukazu; Inoue, Shinya; Nitta, Issei; Nakao, Kenichiro; and Kikumoto, Ryoji, 4,613,598, Cl. 514-211.000.
Inoue, Yoshihisa: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.
Inoue, Yukio; and Mizunoe, Katsumi, to Nippon Kogaku K.K. Tracking device with linear motor. 4,613,962, Cl. 369-44.000.
Insta-Hut Inc.: *See*—
Simpson, David, 4,612,948, Cl. 135-112.000.
Institut Francais du Petrole: *See*—
Chauvin, Yves; Commereuc, Dominique; Cruypelinck, Daniel; Hugues, Francois; and Vidouta, Georges, 4,613,726, Cl. 585-861.000.
Grehier, Alain; Rojey, Alexandre; and Benoist, Francois, 4,612,982, Cl. 165-166.000.
Institute of Zoology Academia Sinica: *See*—
Dehming, Zhou, 4,613,419, Cl. 204-299.00R.
INSUMMA-Projektgesellschaft mit beschrankter Haftung: *See*—
Koch, Christian; and Erdlen, Erwin, 4,613,583, Cl. 502-252.000.
Intech Corporation: *See*—
Glaze, John W., Jr.; and Cline, Ernest E., 4,613,065, Cl. 223-37.000.
Integrated Ionics Inc.: *See*—
Lauks, Imants R., 4,613,422, Cl. 204-419.000.
Intel Corporation: *See*—
Chwang, Ronald J. C., 4,613,886, Cl. 357-42.000.
International Business Machines Corporation: *See*—
Andresen, Mark E., 4,613,936, Cl. 364-200.000.
Bruce, James A.; and Narechania, Rajesh G., 4,612,805, Cl. 73-150.00A.
Chiong, Kaolin N.; Yang, Bea-Jane L.; and Yang, Jer-Ming, 4,613,398, Cl. 156-628.000.
Crouse, William G.; Cunningham, Earl A.; and Vinal, Albert W., 4,613,915, Cl. 360-77.000.
Culican, Edward F.; Graf, Matthew C.; and Ritchie, Leonard C., 4,613,958, Cl. 365-189.000.
Dick, Carroll J., 4,613,775, Cl. 307-480.000.
Di Stefano, Thomas H.; and Sadofsky, Robert, 4,613,966, Cl. 369-100.000.
Godard, Dominique, 4,613,731, Cl. 179-170.200.
Johnson, Mark, 4,613,916, Cl. 360-78.000.
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., 4,613,345, Cl. 51-293.000.
International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,613,510, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,613,511, Cl. 426-535.000.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,613,706, Cl. 568-322.000.
International Microelectronic Products: *See*—
Shenton, Graham; Jones, Ioan G.; Lucas, David W.; and Barton, Ronald E., 4,613,940, Cl. 364-490.000.
International Standard Electric Corporation: *See*—
Hofgen, Gunter, 4,613,864, Cl. 343-357.000.
International Telephone & Telegraph Corporation: *See*—
Selvin, Gerald J.; and Espiritu, Hermenegildo A., 4,613,198, Cl. 339-141.000.
InterNorth, Inc.: *See*—
Lampe, W. Dean, 4,612,912, Cl. 126-400.000.
Interox Chemicals Limited: *See*—
Sanderson, William R., 4,613,452, Cl. 252-186.230.
Intevep, S.A.: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
Iqbal, Abul: *See*—
Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., 4,613,669, Cl. 546-167.000.
Irie, Namio: *See*—
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,613,153, Cl. 280-689.000.
Irikura, Koji; Hikishima, Keisaku; and Fujisaki, Koichiro, to Kanzaki Kokyukoki Mfg. Co., Ltd. Power transmission for working vehicles. 4,613,024, Cl. 192-18.00A.
Iseki, Junkichi: *See*—
Sivilotti, Olivo G.; and Iseki, Junkichi, 4,613,414, Cl. 204-70.000.
Ishibashi, Toru; and Taira, Shigeo, to Diesel Kiki Co., Ltd. Fuel injection valve. 4,612,893, Cl. 123-447.000.
Ishida, Hiroshi; and Nakajima, Hitoshi, to Research Association for Utilization of Light Oil. Process for producing a 1,4-dialkylbenzene. 4,613,717, Cl. 585-467.000.
Ishida, Shiro; Sato, Yoshihiko; and Konagaya, Isao, to Isuzu Motors Limited. Diesel engine. 4,612,888, Cl. 123-261.000.
Ishii, Hakumi: *See*—
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,612,822, Cl. 74-493.000.
Ishii, Isao: *See*—
Okahashi, Kazuo; Hayashi, Osamu; Ishii, Isao; and Kobayashi, Toshiyuki, 4,613,167, Cl. 285-54.000.
Ishii, Masaharu: *See*—
Sato, Eiji; Fukuda, Tamio; Ishii, Masaharu; Nakamura, Mitsuru; and Nakamura, Yozo, 4,613,285, Cl. 417-214.000.
Ishii, Satoshi, to Pioneer Electronic Corporation. Voltage to current conversion circuit. 4,613,776, Cl. 307-490.000.
Ishikawa, Katsuji, to Kabushiki Kaisha Komatsu Seisakusho. Constant torque control system for a variable displacement pump or pumps. 4,613,286, Cl. 417-216.000.
Ishikawa, Masanobu: *See*—
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,612,822, Cl. 74-493.000.
Ishikawa, Youhei: *See*—
Wada, Hidekazu; and Ishikawa, Youhei, 4,613,838, Cl. 333-232.000.
Ishiwatari, Keizo: *See*—
Miyatake, Norio; Uenishi, Mitsuaki; Kashimura, Nobuo; and Ishiwatari, Keizo, 4,613,919, Cl. 360-118.000.
Ishiyama, Isamu: *See*—
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.
Ishizuka, Toshiro: *See*—
Sekiya, Masayoshi; Ishizuka, Toshiro; Maeda, Daiharu; Miyamoto, Kenzo; and Shimazoe, Takahiro, 4,613,650, Cl. 524-828.000.
Isoda, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Electronic device using electron transport proteins. 4,613,541, Cl. 428-212.000.
Isowa Industry Company, Ltd.: *See*—
Hasegawa, Kazumi, 4,613,395, Cl. 156-378.000.
Isuzu Motors Limited: *See*—
Ishida, Shiro; Sato, Yoshihiko; and Konagaya, Isao, 4,612,888, Cl. 123-261.000.

Itani, Abdallah M.; and Roberts, Victor D., to General Electric Company. Driver circuit controller for AC to AC converters. 4,613,795, Cl. 315-205.000.

Ito, Katsunori: *See*—
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, 4,612,894, Cl. 123-494.000.

Itoh, Eiko: *See*—
Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,613,591, Cl. 514-34.000.

ITT Corporation: *See*—
Foglesonger, John D.; and Masters, Robert A., 4,613,839, Cl. 333-239.000.
Hoffman, Leonard J., 4,613,865, Cl. 343-417.000.

ITT Industries Inc.: *See*—
Turley, Stephen E. H., 4,613,387, Cl. 148-171.000.
Weiler, Rolf; Thiel, Rudolf; Bach, Uwe; and Panek, Peter, 4,613,018, Cl. 188-72.400.

Iuchi, Tohru: *See*—
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Ohya, Yoshihiro, 4,613,842, Cl. 336-218.000.

Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device having a sense amplifier circuit. 4,613,957, Cl. 365-189.000.

Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Wafer exposure apparatus. 4,613,230, Cl. 355-53.000.

Iwai, Yuzuru: *See*—
Omura, Satoshi; Tanaka, Haruo; Hinotozawa, Kiyoizumi; Murata, Masatsune; and Iwai, Yuzuru, 4,613,355, Cl. 71-86.000.

Iwamatsu, Kouji: *See*—
Miyoshi, Tatuo; Uno, Jyoji; and Iwamatsu, Kouji, 4,613,301, Cl. 431-259.000.

Iwamura, Tadaaki: *See*—
Saito, Sadayuki; Hamada, Shunji; Iwamura, Tadaaki; and Takabe, Ryoji, 4,613,113, Cl. 266-83.000.

Iwanaga, Toshikazu; and Hara, Kazuo, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system. 4,612,892, Cl. 123-438.000.

Iwanczyk, Jan S.; Barton, Jeff B.; Dabrowski, Andrzej J.; and Schnepple, Wayne F., to University of Southern California. Mercuric iodide light detector and related method. 4,613,756, Cl. 250-361.00R.

Iwasa, Hiroki: *See*—
Tsuge, Hiroshi; Fujiwara, Akinori; Iwasa, Hiroki; Nagasaka, Chikao; and Muraoka, Tsutomu, 4,613,188, Cl. 297-250.000.

Iwasa, Yoshio: *See*—
Urabe, Suehiro; and Iwasa, Yoshio, 4,612,903, Cl. 123-432.000.

Iwasaki, Takao: *See*—
Katto, Takayuki; Kouyama, Toshitaka; Iwasaki, Takao; and Shiiki, Zenya, 4,613,654, Cl. 525-537.000.

Iwase, Takatoshi: *See*—
Hibi, Yasuo; Shibata, Tadahiko; and Iwase, Takatoshi, 4,613,034, Cl. 198-465.100.

Iwase, Takayuki; and Ohashi, Tsuneo, to Brother Kogyo Kabushiki Kaisha. Ribbon lift mechanism for a typewriter. 4,613,248, Cl. 400-697.100.

Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Engine operating parameter control apparatus. 4,612,900, Cl. 123-425.000.

Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Engine ignition timing control apparatus. 4,612,901, Cl. 123-425.000.

Iwatsuki, Makoto: *See*—
Yamazaki, Toshihiko; Murase, Shoji; Suzuki, Katsuyuki; and Iwatsuki, Makoto, 4,613,359, Cl. 71-122.000.

Iwaya, Fukuo: *See*—
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.

Izaki, Kansei: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.

Izuhara, Koichi: *See*—
Oyachi, Tomio; Takahashi, Minoru; Izuhara, Koichi; Akiyama, Setsuo; and Yoshikawa, Masato, 4,613,403, Cl. 156-643.000.

Jablonski, Daniel G.; and Watkins, Richard W., to United States of America, Navy. High output programmable signal current source for low output impedance applications. 4,613,810, Cl. 323-271.000.

Jacobsen, Stephen C.; Wright, Harlan R., deceased; and by Pendell, Gail J., general personal representative, to University of Utah. Articulated prosthetic wrist. 4,613,331, Cl. 623-61.000.

Jacobson, Clayton J. Radially segmented plastic building. 4,612,741, Cl. 52-79.400.

Jacobson, Earl B. Radiation attenuating fluid work environment. 4,613,476, Cl. 376-249.000.

Jaecker, John A.; and Johnson, Marvin F. L., to Atlantic Richfield Company. Hydroxylated magnesia support. 4,613,718, Cl. 585-500.000.

Jaeger, Charles W.: *See*—
Le, Hue P.; Jaeger, Charles W.; and Oswald, James C., 4,613,875, Cl. 346-140.00R.

Jagenberg AG: *See*—
Buchholz, Rainer, 4,613,397, Cl. 156-476.000.

Jalovec, Lee J.: *See*—
Knierim, Daniel G.; and Jalovec, Lee J., 4,613,950, Cl. 364-569.000.

James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,613,494, Cl. 423-490.000.

James, Charles E., to FLM Building Products, Inc. Vehicle mounted shipping rack. 4,613,263, Cl. 410-32.000.

James River Corporation: *See*—
Kuchenbecker, Morris W., 4,613,046, Cl. 206-622.000.

Jansen, Frank: *See*—
Mort, Joseph; Jansen, Frank; Okumura, Koji; Grammatica, Steven J.; and Morgan, Michael A., 4,613,556, Cl. 430-57.000.

Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,612,694, Cl. 29-450.000.

Jaworowski, Mark R.: *See*—
Packer, Louis L.; Bosshart, George S.; Jaworowski, Mark R.; and Kuntz, Urban E., 4,613,259, Cl. 406-14.000.

Jaycox, Donald F.: *See*—
Cwirzen, Casimir; and Jaycox, Donald F., 4,613,732, Cl. 179-178.000.

Jeanneaux, Francois: *See*—
Riess, Jean; Jeanneaux, Francois; Le Blanc, Maurice; and Lantz, Andre , 4,613,708, Cl. 570-136.000.

Jenkner, Detlef. Process for the parallel splitting up of trimmed workpiece panels, in particular, of laminated, compressed wood panels. 4,612,966, Cl. 144-366.000.

Jennings, Roger. Painter's cap printing. 4,612,856, Cl. 101-129.000.

Jensen Petersen, Herta G.: *See*—
Carlsson, Jan-Inge L.; Jensen Petersen, Herta G.; and Stamvik, Anders R., 4,613,695, Cl. 564-33.000.

Jeppsson, Jan, to Boeing Company, The. Servo system for measuring and controlling the amount of torque being applied to rotating tools and method. 4,613,800, Cl. 318-434.000.

Jergl, Joseph J.; and Kump, William H., to GNB Incorporated. Venting system for electric storage batteries. 4,613,550, Cl. 429-53.000.

Jeschke, Willi, to Heidelberger Druckmaschinen AG. Method and device for feeding sheets in register in a sheet-processing machine. 4,613,125, Cl. 271-227.000.

Jiang, Ching-Lin, to Thomson Components-Mostek Corportion. Zero power CMOS redundancy circuit. 4,613,959, Cl. 365-200.000.

Jocham, Dieter: *See*—
Dietrich, Ralph; Jocham, Dieter; Unsold, Eberhard; Weinsheimer, Wolfram; and Gorisch, Wolfram, 4,612,938, Cl. 128-665.000.

Johansson, Leif: *See*—
Berg, Hans G.; Holmstrom, Sven A.; and Johansson, Leif, 4,613,365, Cl. 75-83.000.

John, Glyn R., to Imperial Chemical Industries PLC. Corrosion inhibitor. 4,613,384, Cl. 148-6.14R.

Johnson, Bertram: *See*—
Smith, Arthur R.; and Johnson, Bertram, 4,612,785, Cl. 66-25.000.

Johnson, Mark, to International Business Machines Corporation. Information storage disk transducer position control system requiring no servo pattern on the storage disk. 4,613,916, Cl. 360-78.000.

Johnson, Marvin F. L.: *See*—
Jaecker, John A.; and Johnson, Marvin F. L., 4,613,718, Cl. 585-500.000.

Johnson, Stuart E., to Crane Co. Modulator preset circuit. 4,613,190, Cl. 303-109.000.

Johnston, Roger A.: *See*—
Drabish, Steve, 4,613,157, Cl. 283-1.00R.

Jones, Anthony E.: *See*—
Cattanach, James B.; and Jones, Anthony E., 4,613,393, Cl. 156-323.000.

Jones, David E. Thermo-electric temperature controller for liquid chemical bubbler containers. 4,612,772, Cl. 62-3.000.

Jones, Ioan G.: *See*—
Shenton, Graham; Jones, Ioan G.; Lucas, David W.; and Barton, Ronald E., 4,613,940, Cl. 364-490.000.

Jonke, Gerhard: *See*—
Brugger, Rudolf; Jonke, Gerhard; and Steinmann, Peter, 4,613,214, Cl. 350-511.000.

Jordan, Heinz, to Technische Gerate-u. Entwicklungsgesellschaft m.b.H. Rigid wing flying craft. 4,613,097, Cl. 244-12.400.

Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, to Korea Advanced Institute of Science and Technology. Redistribution catalyst and methods for its preparation and use to convert chlorosilicon hydrides to silane. 4,613,491, Cl. 423-347.000.

Kabel- und Metallwerke Gutehoffnungshuette: *See*—
Schmidtchen, Hans-Martin, 4,613,166, Cl. 285-53.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Hasegawa, Kiyoshi; Matsuo, Hisashi; and Hashimoto, Hideki, 4,613,803, Cl. 318-568.000.
Kitagawa, Soichi, 4,612,788, Cl. 72-13.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ikari, Masanori, 4,612,975, Cl. 165-43.000.
Ishikawa, Katsuji, 4,613,286, Cl. 417-216.000.

Kabushiki Kaisha Miyano Tekkosho: *See*—
Ushigoe, Tomio; Kobayashi, Takeo; Yoshinaga, Yoshitsugu; Tsuchiya, Keiro; and Miyagawa, Kazuo, 4,612,832, Cl. 82-3.000.

Kabushiki Kaisha Tokai-rika-denki-seisakusho: *See*—
Tsuge, Hiroshi; Fujiwara, Akinori; Iwasa, Hiroki; Nagasaka, Chikao; and Muraoka, Tsutomu, 4,613,188, Cl. 297-250.000.

Kabushiki Kaisha Toshiba: *See*—
Manabe, Yoshinori, 4,613,122, Cl. 269-322.000.
Mase, Yasukazu; Abe, Masahiro; Aoyama, Masaharu; and Ajima, Takashi, 4,613,888, Cl. 357-54.000.

Masuko, Akinori; Kuroiwa, Wataru; Shimizu, Yasufumi; and Hirosawa, Hideki, 4,613,826, Cl. 331-14.000.
Matsuo, Yukito; Tamada, Masuo; Sawafuji, Takashi; and Azukizawa, Teruo, 4,613,805, Cl. 318-687.000.
Naito, Hiroyuki; and Tohara, Masahiro, 4,613,872, Cl. 346-1.100.
Ogura, Tsuneo, 4,613,381, Cl. 148-1.500.
Tanaka, Shun-ichiro, 4,613,549, Cl. 428-469.000.

Kadowaki, Shuichiro: *See*—
Oguri, Tomei; Morinaka, Yasuhiro; and Kadowaki, Shuichiro, 4,613,613, Cl. 514-461.000.

Kadowaki, Takashi: *See*—
Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, 4,613,564, Cl. 430-549.000.
Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, 4,613,565, Cl. 430-549.000.

Kageorge, Pedro W., to B. F. Goodrich Company, The. Pneumatic deicers with template. 4,613,102, Cl. 244-134.00A.

Kainer, Hartmut: *See*—
Palz, Helmut; and Kainer, Hartmut, 4,612,981, Cl. 165-158.000.

Kaiser, Steven W., to Union Carbide Corporation. Small olefin interconversions. 4,613,721, Cl. 585-643.000.

Kajiwara, Akiharu: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.

Kajiwara, Shigemasa: *See*—
Ajiki, Yoshio; and Kajiwara, Shigemasa, 4,612,884, Cl. 123-90.160.

Kajiwara, Toshiyuki: *See*—
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.

Kakei, Tsutomu: *See*—
Uesugi, Akio; Kakei, Tsutomu; and Takeuchi, Makoto, 4,613,413, Cl. 204-33.000.

Kaken Pharmaceutical Co. Ltd.: *See*—
Katayama, Takashi; and Hazato, Tadahiko, 4,613,588, Cl. 514-23.000.
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.

Kaku, Hiroyuki: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.

Kakuichi Technical Development Service Kabushiki Kaisha: *See*—
Tanaka, Kenichi, 4,613,389, Cl. 156-143.000.

Kalsi, Manmohan S.: *See*—
Rao, M. Vikram; Kalsi, Manmohan S.; and Alvarez, Patricio D., 4,613,443, Cl. 252-21.000.

Kamen, Christopher R.; and Bollinger, James E. Padded car cover. 4,612,967, Cl. 150-52.00K.

Kamioka, Takashi: *See*—
Nakamura, Masato; and Kamioka, Takashi, 4,613,526, Cl. 427-356.000.

Kamitsos, Efstratios I.: *See*—
Risen, William M., Jr.; and Kamitsos, Efstratios I., 4,613,553, Cl. 430-2.000.

Kamitsu Seisakusho Ltd.: *See*—
Nakai, Shoji; and Akimoto, Koji, 4,613,092, Cl. 242-46.400.

Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; Imazu, Keinosuke; and Tomioka, Hidehiro, to Omron Tateisi Electronics, Co. Proximity switch having variable gain oscillator. 4,613,830, Cl. 331-65.000.

Kamm, Eugen: *See*—
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, 4,613,095, Cl. 242-198.000.

Kanai, Kenji; Sasaki, Seishi; Takahashi, Ken; and Sugita, Ryuji, to Matsushita Electric Industrial Co., Ltd. Perpendicular magnetic playback head and a perpendicular magnetic recording and reproducing device. 4,613,918, Cl. 360-113.000.

Kanazashi, Takeshi; and Kanbe, Toru, to Sanden Corporation. Brewing apparatus. 4,612,850, Cl. 99-289.00R.

Kanbe, Toru: *See*—
Kanazashi, Takeshi; and Kanbe, Toru, 4,612,850, Cl. 99-289.00R.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Fujita, Tamio, 4,613,178, Cl. 293-128.000.

Kaneko, Shingo: *See*—
Nakamura, Shunichi; Okamura, Kenji; Kaneko, Shingo; and Sumi, Kiyoshi, 4,613,643, Cl. 524-426.000.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,612,714, Cl. 36-136.000.

Kansas State University Research Foundation: *See*—
MacKay, Vivian L.; and Manney, Thomas R., 4,613,572, Cl. 435-253.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Irikura, Koji; Hikishima, Keisaku; and Fujisaki, Koichiro, 4,613,024, Cl. 192-18.00A.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Nakamura, Masato; and Kamioka, Takashi, 4,613,526, Cl. 427-356.000.

KAO Corporation: *See*—
Hara, Kenji; and Eguchi, Yasuteru, 4,613,447, Cl. 252-91.000.

Kaplan, Arthur B.: *See*—
Spencer, David R.; Goldstein, Amnon.; Grey, David; Balchunas, Theodore G.; and Kaplan, Arthur B., 4,613,877, Cl. 346-160.000.

Kar-Glo Industries, Inc.: *See*—
Aeschliman, Walter H., 4,613,042, Cl. 206-419.000.

Karlowsky, Ernest W. Auger arrangement for unloading a truck box. 4,613,275, Cl. 414-489.000.

Karlsson, Eils: *See*—
Nilsson, Nils-Olov; Andersson, Ingmar; Sandberg, Ulrik; and Karlsson, Eils, 4,613,376, Cl. 106-282.000.

Karr, Michael A., Jr., to Gray Tool Company. Shear type gate valve. 4,612,983, Cl. 166-55.000.

Kasai, Michio: *See*—
Yonaiyama, Rikio; Kasai, Michio; and Atsumi, Nobukazu, 4,613,647, Cl. 524-514.000.

Kasevich, Raymond S.; Dwyer, Arthur S.; and Guerreri, Bart G., to SCD Incorporated. Microwave dipole probe for in vivo localized hyperthermia. 4,612,940, Cl. 128-804.000.

Kashimura, Nobuo: *See*—
Miyatake, Norio; Uenishi, Mitsuaki; Kashimura, Nobuo; and Ishiwatari, Keizo, 4,613,919, Cl. 360-118.000.

Katalistiks, Inc.: *See*—
Edison, Robert R., 4,613,428, Cl. 208-113.000.

Kataoka, Isamu, to Takara Co., Ltd. Doll toy. 4,613,315, Cl. 446-355.000.

Kataoka, Koji: *See*—
Hoshino, Yutaka; Kataoka, Koji; and Asanaka, Yasumasa, 4,613,628, Cl. 521-72.000.

Katayama, Kouichi: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.

Katayama, Shigeki: *See*—
Kohno, Mitsuo; Katayama, Shigeki; and Matsuda, Kazuo, 4,613,441, Cl. 210-500.360.

Katayama, Takashi; and Hazato, Tadahiko, to Kaken Pharmaceutical Co. Ltd. Benzaldehyde and 4,6-O-benzylidene-D-glucose for alleviating pain. 4,613,588, Cl. 514-23.000.

Katayama, Yoshifumi; Shimada, Toshikazu; and Maruyama, Eiichi, to Hitachi, Ltd. Method of forming passivated polycrystalline semiconductors. 4,613,382, Cl. 148-1.500.

Katerberg, James A., to Eastman Kodak Company. Guard drops in an ink jet printer. 4,613,871, Cl. 346-1.100.

Kato, Takeshi: *See*—
Shichijo, Hajime; Tsukatani, Masamitsu; and Kato, Takeshi, 4,613,736, Cl. 200-317.000.

Katto, Takayuki; Kouyama, Toshitaka; Iwasaki, Takao; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polyarylenesulfide complexes, processes for production and uses thereof. 4,613,654, Cl. 525-537.000.

Kau, Heinz; and Russow, Jurgen, to Hoechst Aktiengesellschaft. Process for the concentration of sulfuric acid. 4,613,416, Cl. 204-98.000.

Kaufer, Helmut: *See*—
Huppe, Reinhard; Kaufer, Helmut; and Lemke, Hans J., 4,613,295, Cl. 425-542.000.

Kauppi, Heikki: *See*—
Kostiainen, Lauri; and Kauppi, Heikki, 4,612,853, Cl. 99-461.000.

Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing device. 4,613,225, Cl. 354-403.000.

Kawakami, Takamasa: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.

Kawamura, Tamio: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.

Kawano, Tomohiro: *See*—
Yanadori, Michio; Kawano, Tomohiro; Miyamoto, Seigo; Nara, Yasuaki; and Oguri, Masahiro, 4,612,974, Cl. 165-10.000.

Kawasaki Steel Corporation: *See*—
Saito, Sadayuki; Hamada, Shunji; Iwamura, Tadaaki; and Takabe, Ryoji, 4,613,113, Cl. 266-83.000.

Kawatsura, Yoshihiro: *See*—
Suzuki, Koji; and Kawatsura, Yoshihiro, 4,613,228, Cl. 355-14.00R.

Keable, John B., to QMI Corporation. Film coater. 4,612,875, Cl. 118-670.000.

Keahey, Frank S., Jr.: *See*—
Traut, G. Robert; Keahey, Frank S., Jr.; Kozakoff, Dennis J.; Bethea, Paul M.; and Hensel, Joseph D., 4,613,540, Cl. 428-212.000.

Keiser, Bruce A., to Nalco Chemical Company. Metal oxide/silica sols. 4,613,454, Cl. 252-313.200.

Keller, Lewis: *See*—
Ward, Wendell; Kumar, Surinder; Mack, Melba; Keller, Lewis; and Fitzwater, Margaret, 4,613,509, Cl. 426-283.000.

Keller, Robert D., Jr.: *See*—
Wreath, Clarence F.; and Keller, Robert D., Jr., 4,613,415, Cl. 204-98.000.

Kelly, Michael A., to Reliable Security Systems, Inc. Door latch mechanism. 4,613,176, Cl. 292-201.000.

Kempas, Hagen. Torquer for gyros. 4,612,819, Cl. 74-5.460.

Kenji, Yabumoto: *See*—
Hashimoto, Kenji, 4,612,674, Cl. 2-406.000.

Kennecott Corporation: *See*—
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,612,971, Cl. 164-454.000.
Kent, Dallas L., to Zenith Electronics Corporation. Continuous, automatic reset of synchronous data receiver upon detection of loss of sync. 4,613,979, Cl. 375-108.000.
Kent, Edward J.; Lore, Dorris F.; and Viereck, Eugene J., Jr., to RCA Corporation. High power RF thick film resistor and method for the manufacture thereof. 4,613,844, Cl. 338-314.000.
Keren, Hanan: *See*—
Blass, Judd; and Keren, Hanan, 4,613,837, Cl. 333-219.000.
Kernforschungsanlage Julich: *See*—
Welter, Jean-Marie; and Rudman, Peter, 4,613,362, Cl. 75-0.50B.
Kersting, Darrel, to Nelson Industries, Inc. Adaptor for connecting tubular members in an exhaust system. 4,613,170, Cl. 285-187.000.
Kesler, Sylvan W. Passive exercise machine. 4,612,917, Cl. 128-33.000.
Kesling, Peter C. Cab and box construction for pickup truck. 4,613,183, Cl. 296-183.000.
Kessler, Efrat; Spierer, Abraham; and Blumberg, Shmaryahum, to Yeda Research and Development Co. Ltd.; and Ramot University Authority for Applied Research and Industrial Development Ltd. Ophthalmic preparations. 4,613,587, Cl. 514-19.000.
Kesten, Martin; Carlson, Leroy H., Jr.; and Kwader, Gary L., to Preston Engravers, Inc. Diecutting roll system with improved scrap disposal capability. 4,613,321, Cl. 493-342.000.
Keverian, Kenneth M., to AT&T Information Systems Inc. Image scanning arrangement. 4,613,987, Cl. 382-65.000.
Kibby, Charles L.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Theddeus P.; and Pannell, Richard B., 4,613,624, Cl. 518-715.000.
Kible, Dieter, to Hewlett-Packard Company. Binary signal comparator using two d flip-flops for precise triggering. 4,613,777, Cl. 307-591.000.
Kida, Koichi: *See*—
Aoyama, Tetsuo; Kida, Koichi; and Uchiyama, Takako, 4,613,684, Cl. 560-179.000.
Kidde Consumer Durables Corp.: *See*—
Rummelsburg, Al. S., 4,613,070, Cl. 228-231.000.
Kielczewski, William J. High/low extension-lift power wheelchair. 4,613,151, Cl. 280-650.000.
Kienzle, Karl-Ernst: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,612,932, Cl. 128-334.00R.
Kijima, Shizumasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.
Kikkawa, Hirofumi: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.
Kikuchi, Akira: *See*—
Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, 4,613,791, Cl. 315-82.000.
Kikuchi, Kunio; and Umehara, Hidetoshi, to Mikuni Kogyo Kabushiki Kaisha. Apparatus for heating fluid by burning liquid fuel. 4,613,072, Cl. 237-12.30C.
Kikuchi, Mitsuru: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.
Kikumoto, Ryoji: *See*—
Fukami, Harukazu; Inoue, Shinya; Nitta, Issei; Nakao, Kenichiro; and Kikumoto, Ryoji, 4,613,598, Cl. 514-211.000.
Kimberly Hills, Ltd.: *See*—
Wolf, Rodney A.; and Zech, Alan G., 4,612,996, Cl. 172-26.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorosulfonylperfluoroalkyl compounds. 4,613,467, Cl. 260-543.00F.
Kimura, Akinori; and Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Developing head for electrophotographic apparatus. 4,613,226, Cl. 355-10.000.
Kimura, Tetsuro; and Ide, Kohei, to Tokyu Sharyo Seizo Kabushiki Kaisha. Solid and liquid goods transporting container. 4,613,053, Cl. 220-22.000.
King, J. Thomas: *See*—
Ataman, Ergin; and King, J. Thomas, 4,613,986, Cl. 382-54.000.
Kings, Donald H. M.: *See*—
Quang, Pham K.; and Kings, Donald H. M., 4,613,554, Cl. 430-39.000.
Kinoshita, Kimiaki: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, 4,613,879, Cl. 346-209.000.
Kinugawa, Masumi: *See*—
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, 4,612,894, Cl. 123-494.000.
Kinzel, Richard: *See*—
Dietrich, Werner; and Kinzel, Richard, 4,612,905, Cl. 123-575.000.
Kiriake, Masaharu, to Murata Kikai Kabushiki Kaisha. Cop transporting system for an automatic winder. 4,613,091, Cl. 242-35.50A.
Kiriseko, Tadashi: *See*—
Fukuda, Takeshi; Mitono, Yoshiharu; and Kiriseko, Tadashi, 4,613,887, Cl. 357-43.000.
Kirk, Randy W., to American Cycle Industries, Inc. Method and apparatus for modular packaging of bicycle cables and locks. 4,613,038, Cl. 206-216.000.
Kitagawa, Kunio, to NEC Corporation. Printing mechanism for dot matrix printers. 4,613,241, Cl. 400-121.000.
Kitagawa, Soichi, to Kabushiki Kaisha Kobe Seiko Sho. Method for controlling shape of material in rolling process. 4,612,788, Cl. 72-13.000.
Kitamura, Mineo: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.
Kitchens, John D.; and Novak, Leo R., to Dow Chemical Company, The. Modification of polymers. 4,613,653, Cl. 525-352.000.
Kiyomura, Yoshiteru: *See*—
Yamashita, Yasuo; Kiyomura, Yoshiteru; and Tohyama, Shunroku, 4,613,529, Cl. 428-15.000.
Kjellqvist, Gosta, to AB Mahler & Soner. Rear underride bumper and side-draft support. 4,613,147, Cl. 280-473.000.
Klar, Robert H.; and Lord, Jeffery R., to Shape Inc. Apparatus and method for assembling a flexible recording disc. 4,613,392, Cl. 156-235.000.
Klein, Gerhard; and Arlt, Dieter, to Bayer Aktiengesellschaft. Aliphatic-cycloaliphatic diisocyanates. 4,613,685, Cl. 560-330.000.
Klein, Gunter, to Gesipa Blindniettechnik Gesellschaft mit beschrankter Haftung. Hydropneumatic gun for setting blind-rivet nuts. 4,612,793, Cl. 72-311.000.
Klintworth, Keith K.: *See*—
Engquist, Karl R.; and Klintworth, Keith K., 4,612,767, Cl. 60-321.000.
Klinzing, George E.: *See*—
Chiang, Shiao-Hung; and Klinzing, George E., 4,613,429, Cl. 209-5.000.
Klockner-Humboldt-Deutz AG: *See*—
Henrich, Gunter; Hoffmann, Harald; Waldhecker, Heinz-Dieter; and Mey, Klaus-Peter, 4,613,344, Cl. 48-77.000.
Knauer, Rolf: *See*—
Maier, Peter; Kutscher, Erwin; and Knauer, Rolf, 4,613,261, Cl. 409-137.000.
Knecht, Siegfried; and Wiesejahn, Jurgen, to Maschinenfabrik Alfred Schmermund GmbH & Co. Method of and device for checking for the presence of a sheet of material. 4,613,750, Cl. 250-223.00R.
Knierim, Daniel G.; and Jalovec, Lee J., to Tektronix, Inc. Self-calibrating time interval meter. 4,613,950, Cl. 364-569.000.
Knofel, Hartmut; and Brockelt, Michael, to Bayer Aktiengesellschaft. Polyisocyanates of the diphenyl methane series. 4,613,687, Cl. 560-359.000.
Knox, Gary W. Self-aligning lubricating stuffing box. 4,613,140, Cl. 277-3.000.
Knox, Thomas A.: *See*—
Battocletti, Joseph H.; Halbach, Richard E.; Antonich, Frederick J.; Sances, Anthony, Jr.; and Knox, Thomas A., 4,613,818, Cl. 324-306.000.
Koal-Kote, Inc.: *See*—
Smith, Charles E., 4,613,523, Cl. 427-220.000.
Kobale, Manfred; Trausch, Gunter; and Wengert, Rolf, to Siemens Aktiengesellschaft. Method for manufacturing a display device. 4,613,399, Cl. 156-634.000.
Kobayashi, Hiroyuki: *See*—
Matsunaga, Osamu; and Kobayashi, Hiroyuki, 4,613,900, Cl. 358-123.000.
Kobayashi, Kazuhiro: *See*—
Kuse, Satoru; Koboshi, Shigeharu; and Kobayashi, Kazuhiro, 4,613,562, Cl. 430-450.000.
Kobayashi, Masahiro: *See*—
Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, 4,613,577, Cl. 501-35.000.
Kobayashi, Takeo: *See*—
Ushigoe, Tomio; Kobayashi, Takeo; Yoshinaga, Yoshitsugu; Tsuchiya, Keiro; and Miyagawa, Kazuo, 4,612,832, Cl. 82-3.000.
Kobayashi, Toshiyuki: *See*—
Okahashi, Kazuo; Hayashi, Osamu; Ishii, Isao; and Kobayashi, Toshiyuki, 4,613,167, Cl. 285-54.000.
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, to Hitachi Microcomputer Hitachi, Ltd.; and Engineering, Ltd. Auto-tracking method and apparatus of a magnetic recording/reproducing apparatus. 4,613,914, Cl. 360-70.000.
Koboshi, Shigeharu: *See*—
Kuse, Satoru; Koboshi, Shigeharu; and Kobayashi, Kazuhiro, 4,613,562, Cl. 430-450.000.
Kobylinski, Theddeus P.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Theddeus P.; and Pannell, Richard B., 4,613,624, Cl. 518-715.000.
Koch, Christian; and Erdlen, Erwin, to INSUMMA-Projektgesellschaft mit beschrankter Haftung. Catalyst for the burning and conversion of gases and higher hydrocarbons and method for producing the catalyst. 4,613,583, Cl. 502-252.000.
Kochloefl, Karel: *See*—
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,613,584, Cl. 502-304.000.
Stadler, Karl-Heinz; and Kochloefl, Karel, 4,613,714, Cl. 585-271.000.

Koehler, Paul C., to Pall Corporation. Porous metal article and method of making. 4,613,369, Cl. 75-246.000.

Kohno, Mitsuo; Katayama, Shigeki; and Matsuda, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic resin porous membrane having an increased strength factor. 4,613,441, Cl. 210-500.360.

Koike, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Racefree CMOS clocked logic circuit. 4,613,773, Cl. 307-443.000.

Koizumi, Teruaki: *See*—
Seshimoto, Osamu; Saito, Yoshio; Koizumi, Teruaki; and Terashima, Masaaki, 4,613,420, Cl. 204-412.000.
Seshimoto, Osamu; Koizumi, Teruaki; Saito, Yoshio; and Yamaguchi, Akira, 4,613,421, Cl. 204-412.000.

Koletzki, Ulrich: *See*—
Wrobel, Gunter; and Koletzki, Ulrich, 4,613,778, Cl. 310-90.000.

Kolibas, James A., to Nordson Corporation. Electrostatic system analyzer. 4,613,813, Cl. 324-72.000.

Kollross, Gunter. Process and apparatus for stringing link sausages manufactured on automatic stuffing machines onto curing and cooking sticks. 4,612,684, Cl. 17-45.000.

Kolster, Harvey L.: *See*—
Bushyhead, Jess C.; Kolster, Harvey L.; Lowry, Michael G.; and Wolf, Fred C., 4,613,047, Cl. 211-55.000.

Kolts, John H.; and Delzer, Gary A., to Phillips Petroleum Company. Dehydrogenation of C_3 and C_4 hydrocarbons over an iron-based catalyst. 4,613,722, Cl. 585-651.000.

Komatsu, Ikuo I.: *See*—
Marotta, Vincent G.; and Komatsu, Ikuo I., 4,613,745, Cl. 219-297.000.

Komatsu, Toshiyuki: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,613,558, Cl. 430-84.000.

Komori, Takashi: *See*—
Machida, Takeshi; and Komori, Takashi, 4,613,218, Cl. 351-206.000.

Komurasaki, Satoshi: *See*—
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,612,900, Cl. 123-425.000.
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,612,901, Cl. 123-425.000.

Konagaya, Isao: *See*—
Ishida, Shiro; Sato, Yoshihiko; and Konagaya, Isao, 4,612,888, Cl. 123-261.000.

Kondo, Hisao: *See*—
Naruto, Masanobu; Kondo, Hisao; and Hata, Go, 4,613,680, Cl. 560-205.000.

Kondo, Takashi: *See*—
Ando, Hirohumi; and Kondo, Takashi, 4,612,771, Cl. 60-611.000.

Kondo, Tatsunori: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.

Konig, Klaus; Pedain, Josef; and Woynar, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates with biuret structure. 4,613,686, Cl. 560-335.000.

Konischev, Alexandr I.; Arestov, Vasily P.; Baburin, Vasily I.; and Ilchenko, Ljudmila P., to Vserosiisky Nauchnoissledovatelsky Institut Vinogradarstva I Vinodelia Imeni Ya.I. Potapenko. Apparatus for champagnization of wine in a continuous flow. 4,612,849, Cl. 99-277.100.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kuse, Satoru; Koboshi, Shigeharu; and Kobayashi, Kazuhiro, 4,613,562, Cl. 430-450.000.
Norikazu, Arai, 4,613,212, Cl. 350-432.000.
Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, 4,613,564, Cl. 430-549.000.
Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, 4,613,565, Cl. 430-549.000.
Yasoshima, Seikichi; Koyama, Mikio; and Okaniwa, Kenichiro, 4,613,567, Cl. 435-7.000.

Konno, Kazutoshi: *See*—
Higuchi, Shigemitsu; Konno, Kazutoshi; and Sampei, Tohru, 4,613,920, Cl. 360-121.000.

Konstant, Anthony N.; and Weider, John J., to Speedrack, Inc. Storage rack having bays with multiple rails and interlocking trolleys. 4,613,270, Cl. 414-276.000.

Kopf, Helmut; and Bucher, Christian, to Ciba-Geigy Corporation. Pharmaceutical capsules of Rifampicin with uniform elution properties. 4,613,496, Cl. 424-14.000.

Korea Advanced Institute of Science and Technology: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,613,491, Cl. 423-347.000.

Kores, Ivar: *See*—
Edberg, Nils; Kores, Ivar; Holmkvist, Gottfrid; and Helmerson, Rickard, 4,613,001, Cl. 175-52.000.

Kostiainen, Lauri; and Kauppi, Heikki, to MKT-Tehtaat Oy. Cheese kettle. 4,612,853, Cl. 99-461.000.

Kotani, Toshihiro: *See*—
Tatsumi, Masayoshi; and Kotani, Toshihiro, 4,613,486, Cl. 422-310.000.

Kotera, Masayuki, to Seikow Chemical Engineering & Machinery, Ltd. Corrosion resistant pump. 4,613,289, Cl. 417-420.000.

Kouba, Jay K.; and Zletz, Alex, to Standard Oil Company (Indiana). Hydrogenation using copper aluminum borate catalyst. 4,613,707, Cl. 568-864.000.

Kouyama, Toshitaka: *See*—
Katto, Takayuki; Kouyama, Toshitaka; Iwasaki, Takao; and Shiiki, Zenya, 4,613,654, Cl. 525-537.000.

Koyama, Mikio: *See*—
Yasoshima, Seikichi; Koyama, Mikio; and Okaniwa, Kenichiro, 4,613,567, Cl. 435-7.000.

Koyama, Takeshi: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.

Kozakoff, Dennis J.: *See*—
Traut, G. Robert; Keahey, Frank S., Jr.; Kozakoff, Dennis J.; Bethea, Paul M.; and Hensel, Joseph D., 4,613,540, Cl. 428-212.000.

Kozar, John J. D-clamp vise. 4,613,120, Cl. 269-71.000.

Krabbe, Alfred: *See*—
Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, 4,613,203, Cl. 350-6.600.

Krallmann, Reinhold: *See*—
Thomas, Michael; Neumann, Peter; Wegerle, Dieter; and Krallmann, Reinhold, 4,613,334, Cl. 8-442.000.

Krampitz, Mark S.: *See*—
Hart, James E.; Mong, William K.; Kyllonen, Allen W.; and Krampitz, Mark S., 4,613,016, Cl. 188-52.000.

Kraus, Richard A.; and Sabon, Thomas W., to Ford Motor Company. Proximity moisture sensor. 4,613,802, Cl. 318-483.000.

Kristensen, Eigil: *See*—
Reyes, Victor; and Kristensen, Eigil, 4,613,346, Cl. 55-4.000.

Kroessler, Peter R. Symmetrical load power reduction device for lighting fixtures. 4,613,792, Cl. 315-97.000.

Krohn, Karsten; and Behnke, Bert, to Hoechst Aktiengesellschaft. Process for the preparation of anthracyclinones. 4,613,464, Cl. 260-384.000.

Kronenthal, Richard L., to Ethicon, Inc. Glass-filled, absorbable surgical devices. 4,612,923, Cl. 128-92.00R.

Kronogard, N. Hakan: *See*—
Selberg, Roberto B. O.; Kronogard, N. Hakan; and Cockin, John, 4,613,133, Cl. 273-195.00B.

Kruger, Christian. Instrument for keeping clear the upper respiratory passages. 4,612,927, Cl. 128-200.260.

Kruger, James B.: *See*—
Siddall, Graham J.; Eaton, Steven G.; Kruger, James B.; Garrettson, Garrett A.; and Neukermans, Armand P., 4,613,981, Cl. 378-34.000.

Krumme, Manfred; and Geisel, Gerhard, to Hermann Heye. Displacement pick-up arrangement for the position detection of a pressing plunger. 4,613,352, Cl. 65-158.000.

Krupper, Gunther, to Industrie-Entwicklungen Krupper. Grip tapes based on plastic-coated supporting materials. 4,613,537, Cl. 428-192.000.

Kubis, Charles S.: *See*—
Walter, John; Roth, Donald J.; and Kubis, Charles S., 4,613,062, Cl. 222-146.200.

Kubo, Katunori: *See*—
Tsujimura, Iwao; and Kubo, Katunori, 4,612,881, Cl. 123-27.0GE.

Kubo, Mitsuo: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Kuchenbecker, Morris W., to James River Corporation. Reclosable package and carton blank. 4,613,046, Cl. 206-622.000.

Kucheria, Chhattar S.; and Wells, Rodney E., to Pfizer Hospital Products Group, Inc. Bonding of bioactive glass coatings. 4,613,516, Cl. 427-2.000.

Kuhne, Karl F., to Carbide Blast Joints, Inc. Increased tensile strength variable diameter protective joint. 4,613,165, Cl. 285-45.000.

Kukes, Simon G.; Nowack, Gerhard P.; and Banks, Robert L., to Phillips Petroleum Company. Oligomerization of olefins. 4,613,719, Cl. 585-528.000.

Kumagai, Naotake: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,613,154, Cl. 280-707.000.

Kumar, Surinder: *See*—
Ward, Wendell; Kumar, Surinder; Mack, Melba; Keller, Lewis; and Fitzwater, Margaret, 4,613,509, Cl. 426-283.000.

Kump, William H.: *See*—
Jergl, Joseph J.; and Kump, William H., 4,613,550, Cl. 429-53.000.

Kunde, Detlev, to Deere & Company. Combine harvester straw chopper stationary knife adjustment. 4,612,941, Cl. 130-27.00R.

Kuntz, Urban E.: *See*—
Packer, Louis L.; Bosshart, George S.; Jaworowski, Mark R.; and Kuntz, Urban E., 4,613,259, Cl. 406-14.000.

Kunzl, Willi: *See*—
Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, 4,612,747, Cl. 52-250.000.

Kuo, Chang-Kiang, to Texas Instruments Incorporated. Random access MOS/memory cell with capacitor and transistor formed in recess. 4,613,889, Cl. 357-54.000.

Kuraray Co., Ltd.: *See*—
Moritani, Tohei; and Ikari, Kyoichiro, 4,613,644, Cl. 524-430.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Katto, Takayuki; Kouyama, Toshitaka; Iwasaki, Takao; and Shiiki, Zenya, 4,613,654, Cl. 525-537.000.

Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, to Honda Motor Co., Ltd.; and Stanley Electric Co., Ltd. Automatic light control apparatus for vehicle. 4,613,791, Cl. 315-82.000.

Kurima, Yoshiko: *See*—
Inoue, Chozo; Kurima, Yoshiko; and Moriguchi, Soyao, 4,613,688, Cl. 562-401.000.

Kuriyama, Kazumi, to Pioneer Electronic Corporation. Support structure for electromechanical transducer. 4,613,202, Cl. 350-6.400.

Kuroiwa, Hiroshi; Nishimura, Yutaka; and Oyama, Yoshishige, to Hitachi, Ltd. Fuel flow detector and fuel controller using fuel flow detector. 4,612,895, Cl. 123-494.000.

Kuroiwa, Wataru: *See*—
Masuko, Akinori; Kuroiwa, Wataru; Shimizu, Yasufumi; and Hirosawa, Hideki, 4,613,826, Cl. 331-14.000.

Kuroki, Junsuke: *See*—
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,613,153, Cl. 280-689.000.

Kurth, Richard R.; and Gabel, Robert A., to Sperry Corporation. Narrowband interference suppression system. 4,613,978, Cl. 375-99.000.

Kuse, Satoru; Koboshi, Shigeharu; and Kobayashi, Kazuhiro, to Konishiroku Photo Industry Co., Ltd. Process of replenishing color developing solution with replenisher compositions. 4,613,562, Cl. 430-450.000.

Kutscher, Erwin: *See*—
Maier, Peter; Kutscher, Erwin; and Knauer, Rolf, 4,613,261, Cl. 409-137.000.

Kuwano, Ryushi; and Nagura, Riichi, to NEC Corporation. Image pickup system capable of reproducing a stereo and/or a nonstereo image by the use of a single optical system. 4,613,899, Cl. 358-88.000.

Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, to Sanyo Electric Co., Ltd. Light sensitive apparatus. 4,613,880, Cl. 357-2.000.

Kuwata, Jun; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Thin-film electroluminescent element. 4,613,546, Cl. 428-336.000.

Kvaerner Brug A/S: *See*—
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, 4,613,252, Cl. 405-76.000.

Kwader, Gary L.: *See*—
Kesten, Martin; Carlson, Leroy H., Jr.; and Kwader, Gary L., 4,613,321, Cl. 493-342.000.

Kwon, Young J.; and Stoltz, Richard A., to Westinghouse Electric Corp. Continuous reactive metal reduction using a salt seal. 4,613,366, Cl. 75-84.500.

Kyle, Nanse R.: *See*—
Gentile, Anthony L.; Kyle, Nanse R.; and Hill, Fred W., 4,613,495, Cl. 423-508.000.

Kyllonen, Allen W.: *See*—
Hart, James E.; Mong, William K.; Kyllonen, Allen W.; and Krampitz, Mark S., 4,613,016, Cl. 188-52.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Okai, Yasuji, 4,613,458, Cl. 530-351.000.

Kysor Industrial Corporation: *See*—
Branz, Michael A.; and Renuad, Paul F., 4,612,775, Cl. 62-126.000.

La-Z-Boy Chair Company: *See*—
LaPointe, Larry P., 4,613,186, Cl. 297-83.000.

Labofina, S.A.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,613,724, Cl. 585-824.000.

Lacombe, Alain; and Vives, Michel, to Societe Europeene de Propulsion. Brake disc with removable pads. 4,613,021, Cl. 188-218.0XL.

Ladney, Michael, Jr.: *See*—
Loren, Norman S.; and Gordon, William E., 4,613,177, Cl. 293-120.000.

Lahres, Hans: *See*—
Fuerter, Gerhard; and Lahres, Hans, 4,613,217, Cl. 351-176.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Pelloux-Gervais, Pierre; and Neret, Jean-Louis, 4,612,773, Cl. 62-50.000.

Laisney, Michel: *See*—
Herbec, Jean-Pierre; Laisney, Michel; Murat, Jacques; and Serpeau, Patrick, 4,613,216, Cl. 350-618.000.

Lajos, Thomas Z. Ski pole handle. 4,613,156, Cl. 280-821.000.

Lamerant, Jean-Michel; Pallez, Francois; and Personnet, Pierre-Bernard, to Uranium Pechiney. High-temperature pretreatment by means of an alkaline aqueous solution of ores having an argillaceous gangue containing at least one usable element. 4,613,361, Cl. 75-2.000.

Lampe, W. Dean, to InterNorth, Inc. Double-layered thermal energy storage module. 4,612,912, Cl. 126-400.000.

Landis, Abraham L.; and Naselow, Arthur B., to Hughes Aircraft Company. Copolymers utilizing isoimides and method of preparing same. 4,613,637, Cl. 524-105.000.

Landsman, Douglas A.: *See*—
Luczak, Francis J.; and Landsman, Douglas A., 4,613,582, Cl. 502-185.000.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Reversible phase change compositions of calcium chloride hexahydrate with potassium chloride. 4,613,444, Cl. 252-70.000.

Lange, Hans: *See*—
Geisler, Edda; Feuerstein, Helmut; and Lange, Hans, 4,613,569, Cl. 435-26.000.

Langer, Horst: *See*—
Focke, Heinz; and Langer, Horst, 4,612,756, Cl. 53-579.000.

Langer, Horst G.; Brady, Thomas P.; Paul, Marsha A.; and Doorakian, George A., to Dow Chemical Company, The. Epoxy phosphate compositions. 4,613,661, Cl. 528-108.000.

Langowski, Faustyn C.: *See*—
Smith, Roger, Jr.; Priest, Joseph R.; Langowski, Faustyn C.; and Hebard, Harry D., 4,613,849, Cl. 340-679.000.

Lantz, Andre : *See*—
Foulletier, Louis; and Lantz, Andre , 4,613,681, Cl. 560-236.000.
Riess, Jean; Jeanneaux, Francois; Le Blanc, Maurice; and Lantz, Andre , 4,613,708, Cl. 570-136.000.

LaPointe, Larry P., to La-Z-Boy Chair Company. Chair with latch mechanism. 4,613,186, Cl. 297-83.000.

Larm, Olle. Process for covalent coupling for the production of conjugates, and polysaccharide containing products thereby obtained. 4,613,665, Cl. 536-20.000.

Lartey, Paul A.: *See*—
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., 4,613,589, Cl. 514-23.000.
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., 4,613,590, Cl. 514-23.000.

Laskowski, Edward J.; and Wolowodiuk, Catherine, to AT&T Bell Laboratories. Semiconductor etching process. 4,613,417, Cl. 204-129.850.

Lasky, Richard J., to Trans-World Manufacturing Corp. 3D display. 4,613,128, Cl. 272-8.00M.

Lasley, Charles T.: *See*—
Gimple, James J.; and Lasley, Charles T., 4,613,082, Cl. 239-690.000.

Lassaiz, Philippe: *See*—
Renaud, Pierre; and Lassaiz, Philippe, 4,613,028, Cl. 192-98.000.

Lassiaz, Philippe; and Mallet, Bernard, to Valeo. Gripping piece to be attached to the diaphragm of a clutch, and an assembly unit consisting of such a diaphragm and such a gripping piece. 4,613,027, Cl. 192-89.00B.

Lathrop, Deborah A. Electrical outlet box enclosure. 4,613,728, Cl. 174-53.000.

Laucus, Johnnie. Refurbished joint and method for refurbishing it. 4,613,250, Cl. 403-11.000.

Lauks, Imants R., to Integrated Ionics Inc. Ambient sensing devices. 4,613,422, Cl. 204-419.000.

Lavine, James P.: *See*—
Losee, David L.; and Lavine, James P., 4,613,402, Cl. 156-643.000.

Law, Hilton, to English Electric Company Limited, The. Power generating equipment. 4,613,760, Cl. 290-1.00C.

Laxa Bruk AB: *See*—
Nilsson, Nils-Olov; Andersson, Ingmar; Sandberg, Ulrik; and Karlsson, Eila, 4,613,376, Cl. 106-282.000.

Layden, George K.; and Prewo, Karl M., to United Technologies Corporation. Method for forming composite articles of complex shapes. 4,613,473, Cl. 264-103.000.

Lazarus, Charles R.: *See*—
Fulger, Charles V.; Haas, Gerhard J.; Herman, Edwin B.; and Lazarus, Charles R., 4,613,507, Cl. 426-28.000.

Lazo de Zbikowski, Juan. External fixation system for osteosynthesis. 4,612,921, Cl. 128-92.00A.

LBP Partnership: *See*—
Cruickshank, John S., 4,613,234, Cl. 356-394.000.

Le, Hue P.; Jaeger, Charles W.; and Oswald, James C., to Tektronix, Inc. Air assisted ink jet head with projecting internal ink drop-forming orifice outlet. 4,613,875, Cl. 346-140.00R.

Le Blanc, Maurice: *See*—
Riess, Jean; Jeanneaux, Francois; Le Blanc, Maurice; and Lantz, Andre , 4,613,708, Cl. 570-136.000.

LeBorgne, Jose : *See*—
Bouvot, Jean-Francois; and LeBorgne, Jose , 4,612,847, Cl. 92-13.100.

Lechat, Jacques B.: *See*—
Aliani, Giorgio; Lechat, Jacques B.; and Smits, Jozef A. F., 4,613,632, Cl. 523-172.000.

Leconte, Philippe, to Rhone-Poulenc Specialites Chimiques. Aldehyde production by hydrocarbonylation of organic halides. 4,613,702, Cl. 568-490.000.

Lee, Agnes Y.: *See*—
Falke, Wilbert L.; Lee, Agnes Y.; and Neumeier, Leander A., 4,613,069, Cl. 228-211.000.

Lee, Chi-long; and Maxson, Myron T., to Dow Corning Corporation. Low temperature polymethylsiloxane containing silicon-bonded hydrogen and curable compositions made therewith. 4,613,659, Cl. 528-15.000.

Lee, Chi-Min. Room exhaust duct. 4,612,909, Cl. 126-299.00D.

Lee, David L.: *See*—
Carter, Charles G.; and Lee, David L., 4,613,357, Cl. 71-94.000.

Lee, Roger K., to United States of America, Air Force. Very high speed lap with positive lift effect. 4,612,733, Cl. 51-119.000.

Lee, Shy-Fuh, to Sandoz Ltd. Phosphorus containing 1-cyclohexene-1,2-dicarboxamides. 4,613,675, Cl. 558-170.000.

Lefco Western, Inc.: *See*—
Evenson, William R., 4,613,290, Cl. 417-517.000.

Lehmkuhl, Robert A. Automatic boring tool. 4,612,831, Cl. 82-1.400.

Leibrand, John G., Sr., to "A" Co. Diesel fuel heater. 4,612,896, Cl. 123-557.000.

Leidig, Alfred: *See*—
Held, Manfred; Leidig, Alfred; Merl, Wilhelm A.; and Stempel, Gunter, 4,613,370, Cl. 75-248.000.
Leier, Wolfgang: *See*—
Arndt, Lutz; Bachmann, Paul; Berges, Hanns-Peter; Leier, Wolfgang; and Vorberg, Dieter, 4,612,957, Cl. 137-565.000.
Leland Stanford Junior University, Board of Trustees of the: *See*—
Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., 4,613,586, Cl. 514-13.000.
Lellinger, David B.: *See*—
Waranowitz, Benjamin, 4,613,103, Cl. 246-473.00A.
Lemke, Dietrich: *See*—
Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, 4,613,203, Cl. 350-6.600.
Lemke, Hans J.: *See*—
Huppe, Reinhard; Kaufer, Helmut; and Lemke, Hans J., 4,613,295, Cl. 425-542.000.
Lerchbaum, Karl: *See*—
Zitz, Alfred; Lerchbaum, Karl; Toferer, Werner; and Sussenbeck, Heinrich, 4,613,256, Cl. 405-299.000.
Lerner, Bernard, to Automated Packaging Systems, Inc. Container forming apparatus. 4,613,320, Cl. 493-198.000.
Lesche, Klaus: *See*—
Hendricks, Udo W.; Lesche, Klaus; Sackmann, Gunter; and Schroer, Wolf-Dieter, 4,613,337, Cl. 8-543.000.
Leslie, Thomas M.: *See*—
Goodby, John W.; and Leslie, Thomas M., 4,613,209, Cl. 350-350.00S.
L'Etat Francais: *See*—
Herbec, Jean-Pierre; Laisney, Michel; Murat, Jacques; and Serpeau, Patrick, 4,613,216, Cl. 350-618.000.
Lever Brothers Company: *See*—
Benzoni, Andre J. E., 4,613,592, Cl. 514-63.000.
Levy, Leon M., to C. A. Parshall, Inc. Endless film cartridge and pressure support plate therefor. 4,613,220, Cl. 352-78.00R.
Lewis, James M., to Lewis, James Marvin. Method of high contrast positive O-quinone diazide photoresist developing using pretreatment solution. 4,613,561, Cl. 430-326.000.
Lewis, James Marvin: *See*—
Lewis, James M., 4,613,561, Cl. 430-326.000.
Lewis, Max L.: *See*—
Willis, William R.; Hunter, James D.; and Lewis, Max L., 4,613,303, Cl. 431-346.000.
Leybold-Heraeus GmbH: *See*—
Arndt, Lutz; Bachmann, Paul; Berges, Hanns-Peter; Leier, Wolfgang; and Vorberg, Dieter, 4,612,957, Cl. 137-565.000.
Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, 4,613,306, Cl. 432-264.000.
Licci..rdello, Michael: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,613,706, Cl. 568-322.000.
Licentia Patent-Verwaltungs GmbH: *See*—
Angerstein, Jorg; and Silber, Dieter, 4,613,884, Cl. 357-39.000.
Liebig, Heinrich. Expanding dowel with setting-force indicator. 4,613,254, Cl. 405-259.000.
Life Light Systems: *See*—
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,613,847, Cl. 340-114.00R.
Lim, John C.: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,613,491, Cl. 423-347.000.
Limbrick, Robert W.: *See*—
McIntyre, Douglas O.; and Limbrick, Robert W., 4,613,264, Cl. 411-55.000.
Lindquist, Per E., to Si Handling Systems, Inc. Driverless tugger vehicle. 4,612,861, Cl. 104-166.000.
LISEGA Kraftwerkstechnik GmbH: *See*—
Hardtke, Hans-Herlof, 4,613,119, Cl. 267-172.000.
Lissau, Edith, executrix: *See*—
Lissau, Frederic, deceased; and Stoltenberg, Michael R., 4,612,954, Cl. 137-360.000.
Lissau, Frederic, deceased (by Lissau, Edith, executrix); and Stoltenberg, Michael R., to Sloan Valve Company. Pedal operated flush valve. 4,612,954, Cl. 137-360.000.
Litherland, Robert M. J.: *See*—
Smith, Ian P.; Prandle, David L.; Barker, Reginald C.; and Litherland, Robert M. J., 4,613,168, Cl. 285-150.000.
Little Screamer Group Limited, The: *See*—
Mueller, John B., III, 4,613,012, Cl. 181-178.000.
Livesay, Richard E., to Caterpillar Inc. Anvil apparatus for a press. 4,612,765, Cl. 59-7.000.
Lobato, Toribio Q., to Clemar Manufacturing Corp. Rain detector for irrigation control system. 4,613,764, Cl. 307-116.000.
Lobb, Daniel R.: *See*—
Shortle, Martin C.; and Lobb, Daniel R., 4,613,201, Cl. 350-6.100.
Loftness, Marvin O. Audio, ultrasonic and RF noise generator for demonstration of electrical interference. 4,613,831, Cl. 331-78.000.
Lohrmann, Gerhard; and Roehrer, Kurt, to Mannesmann AG. Single sheet feeding. 4,613,124, Cl. 271-16.000.
Lok, Kar P.: *See*—
Ober, Christopher K.; Lok, Kar P.; Hair, Michael L.; and Branston, Randolph E., 4,613,559, Cl. 430-137.000.
Longi, Paolo; Giannini, Umberto; Mazzocchi, Romano; and Deluca, Domenico, to Montedison S.p.A. Catalysts for the polymerization of olefins. 4,613,655, Cl. 526-114.000.
Loomis, Gary L.; and Statz, Robert J., to Du Pont de Nemours, E. I., and Company. Thermoplastic elastomeric compositions based on compatible blends of an ethylene copolymer and vinyl or vinylidene halide polymer. 4,613,533, Cl. 428-36.000.
Loomis, Phillip E.; Paukovits, Edward J., Jr.; Schuppert, Leo V., Jr.; and Spong, Richard V., to AMP Incorporated. Component insertion apparatus. 4,612,700, Cl. 29-564.600.
Lord, Jeffery R.: *See*—
Klar, Robert H.; and Lord, Jeffery R., 4,613,392, Cl. 156-235.000.
Lore, Dorris F.: *See*—
Kent, Edward J.; Lore, Dorris F.; and Viereck, Eugene J., Jr., 4,613,844, Cl. 338-314.000.
Loren, Norman S.; and Gordon, William E., to Ladney, Michael, Jr. Vehicle bumper. 4,613,177, Cl. 293-120.000.
Lorenz, Robin G.: *See*—
Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., 4,613,586, Cl. 514-13.000.
Losee, David L.; and Lavine, James P., to Eastman Kodak Company. Method of making edge-aligned implants and electrodes therefor. 4,613,402, Cl. 156-643.000.
Lovendusky, Charles M.; and White, Gregory G., to Du Pont de Nemours, E. I., and Company. Printed circuit board fabrication apparatus. 4,612,699, Cl. 29-739.000.
Lower, Jerry L., to Zimmer, Inc. Compression hip screw. 4,612,920, Cl. 128-92.0BA.
Lowry, Michael G.: *See*—
Bushyhead, Jess C.; Kolster, Harvey L.; Lowry, Michael G.; and Wolf, Fred C., 4,613,047, Cl. 211-55.000.
Lubieniecki, Valdemar M., to Goulds Pumps, Incorporated. Hydrodynamic seal. 4,613,281, Cl. 415-170.00B.
Lubrizol Corporation, The: *See*—
Dorer, Casper J., Jr.; and Hayashi, Katsumi, 4,613,342, Cl. 44-62.000.
Lucas, David W.: *See*—
Shenton, Graham; Jones, Ioan G.; Lucas, David W.; and Barton, Ronald E., 4,613,940, Cl. 364-490.000.
Lucas Industries Public Limited Company: *See*—
Fairbairn, Terence W. F.; and Capewell, Terence J., 4,613,023, Cl. 192-8.00R.
Lucasey Manufacturing Company: *See*—
Boscacci, William L., 4,613,109, Cl. 248-553.000.
Luccarelli, Domenick, Jr.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,613,511, Cl. 426-535.000.
Luczak, Francis J.; and Landsman, Douglas A., to United Technologies Corporation. Method for making ternary fuel cell catalysts containing platinum cobalt and chromium. 4,613,582, Cl. 502-185.000.
Lum, Genevieve S., to Ethyl Corporation. Polyphosphazene magnetic tape lube. 4,613,548, Cl. 428-411.100.
Lumma, William C., Jr.: *See*—
Diamond, Julius; Lumma, William C., Jr.; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,613,609, Cl. 514-396.000.
Lurie, Oscar M., to Control Data Corporation. Television monitoring device. 4,613,904, Cl. 358-142.000.
Lutze, Theodor: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,612,932, Cl. 128-334.00R.
M/A-COM Linkabit, Inc.: *See*—
Gilhousen, Klein S.; Newby, Charles F., Jr.; and Moerder, Karl E., 4,613,901, Cl. 358-122.000.
M.A. Golf Training International AB: *See*—
Selberg, Roberto B. O.; Kronogard, N. Hakan; and Cockin, John, 4,613,133, Cl. 273-195.00B.
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Heinen, Manfred, 4,613,141, Cl. 277-27.000.
Maatta, Raimo, to Oy Tampella AB. Device for treatment of wastewater by means of anaerobic fermentation. 4,613,434, Cl. 210-151.000.
MacDermid, John T., to Wastesaver Corporation. Evacuator system and process for an evaporative recovery system. 4,613,412, Cl. 203-91.000.
Machate, Rainer: *See*—
Vonhausen, Robert; and Machate, Rainer, 4,612,863, Cl. 108-28.000.
Machida, Takeshi; and Komori, Takashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Illuminating light beam axis adjusting mechanism in ophthalmoscope with photographing device. 4,613,218, Cl. 351-206.000.
Mack, Melba: *See*—
Ward, Wendell; Kumar, Surinder; Mack, Melba; Keller, Lewis; and Fitzwater, Margaret, 4,613,509, Cl. 426-283.000.
MacKay, Vivian L.; and Manney, Thomas R., to Kansas State University Research Foundation; and Rutgers Research and Educational Foundation, a part interest to each. Yeast BAR1 gene plasmid. 4,613,572, Cl. 435-253.000.
MacLaughlin, Donald N., to Cosden Technology, Inc. Method and apparatus for automatically controlling the temperature of a heater element. 4,613,746, Cl. 219-490.000.
Maczynski, Andrzej: *See*—
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,790, Cl. 72-96.000.

Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,791, Cl. 72-98.000.
Maddock, Robert T., to Mobil Oil Corporation. Thermoplastic bag and method of forming the same. 4,613,988, Cl. 383-8.000.
Maeda, Daiharu: *See*—
Sekiya, Masayoshi; Ishizuka, Toshiro; Maeda, Daiharu; Miyamoto, Kenzo; and Shimazoe, Takahiro, 4,613,650, Cl. 524-828.000.
Maejima, Hideo: *See*—
Masuda, Ikuro; Maejima, Hideo; Hayashi, Terumine; and Hatayama, Kazumi, 4,613,970, Cl. 371-25.000.
Magis Farmaceutici s.r.l.: *See*—
Moroni, Adolfo, 4,613,602, Cl. 514-252.000.
Magis Farmaceutrici s.r.l.: *See*—
Moroni, Adolfo, 4,613,596, Cl. 514-210.000.
Magyar, Arpad M., to Pennzoil Company. Gelled detergent composition and cleaning pads containing same. 4,613,446, Cl. 252-91.000.
Mahajan, Devinder; Slegeir, William A.; Sapienza, Richard S.; and O'Hare, Thomas E., to United States of America, Energy. Low temperature synthesis of methyl formate. 4,613,623, Cl. 518-700.000.
Maharaj, Kenrick B.: *See*—
Palfery, Kenneth J.; Maharaj, Kenrick B.; Malcom, John S.; Puckering, Donald R.; and Wong, Kee-Shong, 4,612,697, Cl. 29-568.000.
Mahl, Ronald M.: *See*—
Hayes, Robert J.; and Mahl, Ronald M., 4,613,260, Cl. 408-74.000.
Maier, Peter; Kutscher, Erwin; and Knauer, Rolf. Router tool. 4,613,261, Cl. 409-137.000.
Mainord, Kenneth R., to Eastman Kodak Company. Emulsifiable modified polymers. 4,613,679, Cl. 560-190.000.
Mains, Robert T., to Parker-Hannifin Corporation. Fuel nozzle with disc filter. 4,613,079, Cl. 239-462.000.
Maistre, Michel, to Societe Europeenne de Propulsion. Pre-stressed truss-like beam with elements in buckled state. 4,612,750, Cl. 52-638.000.
Majewski, Miroslawa, to Allied Corporation. Stepper motor logic circuit. 4,613,806, Cl. 318-696.000.
Maki, Takao; and Yokoyama, Toshiharu, to Mitsubishi Chemical Industries Limited. Process for producing aromatic aldehydes. 4,613,700, Cl. 568-435.000.
Makilaakso, Antero, to Printal OY. Packaging foil. 4,613,536, Cl. 428-124.000.
Malcolm, Craig G.: *See*—
Moss, Alvin; Shepherd, Charles G.; Malcolm, Craig G.; Malcolm, Richard E.; and Schmitz, Peter J., 4,613,006, Cl. 180-9.250.
Malcolm, Richard E.: *See*—
Moss, Alvin; Shepherd, Charles G.; Malcolm, Craig G.; Malcolm, Richard E.; and Schmitz, Peter J., 4,613,006, Cl. 180-9.250.
Malcom, John S.: *See*—
Palfery, Kenneth J.; Maharaj, Kenrick B.; Malcom, John S.; Puckering, Donald R.; and Wong, Kee-Shong, 4,612,697, Cl. 29-568.000.
Mallet, Bernard: *See*—
Lassiaz, Philippe; and Mallet, Bernard, 4,613,027, Cl. 192-89.00B.
Malo-Renault, Francois: *See*—
Catros, Jean-Yves; Chapuis, Franck; and Malo-Renault, Francois, 4,613,894, Cl. 358-13.000.
Mammach, Peter, to Siemens Aktiengesellschaft. Gas discharge display device and method for its production. 4,613,312, Cl. 445-25.000.
Manabe, Yoshinori, to Kabushiki Kaisha Toshiba. CT couch apparatus having a lift. 4,613,122, Cl. 269-322.000.
Manchester R & D Partnership: *See*—
Fergason, James L., 4,613,207, Cl. 350-331.00R.
Manners-Smith, John; Thompson, Christopher G.; and Bailey, John E., to Ferranti PLC. Large scale display. 4,612,720, Cl. 40-211.000.
Mannesmann AG: *See*—
Lohrmann, Gerhard; and Roehrer, Kurt, 4,613,124, Cl. 271-16.000.
Manney, Thomas R.: *See*—
MacKay, Vivian L.; and Manney, Thomas R., 4,613,572, Cl. 435-253.000.
Manservisi, Renato; and Cavicchi, Dario, to Sasib S.p.A. Cigarette testing and/or leveling device. 4,612,803, Cl. 73-81.000.
Manville Service Corporation: *See*—
Taylor, Bobby C.; and Olsen, Peter C., Jr., 4,612,753, Cl. 53-398.000.
Marantz Japan Inc.: *See*—
Saito, Ikuo; Minakata, Ryosuke; and Suzuki, Yukio, 4,613,044, Cl. 206-444.000.
Maranzana, Giorgio: *See*—
Marraccini, Antonio; Carlini, Filippo M.; Bottaccio, Giorgio; Pasquale, Antonio; and Maranzana, Giorgio, 4,613,667, Cl. 546-14.000.
Marchesini, Sisto, to ICU Intercommerz Union S.A. Folding chair. 4,613,185, Cl. 297-39.000.
Marchetti, Salvatore: *See*—
Rossi, Pier P.; and Marchetti, Salvatore, 4,613,694, Cl. 562-590.000.
Marcoll, Joachim: *See*—
Westrup, Bernhard; and Marcoll, Joachim, 4,613,575, Cl. 436-106.000.
Marcon, Joel; Durant, Jacques; Simon, Georges; and Boisseau, Alain, to Etat Francais. Dual ammunition feed for automatic weapons. 4,612,843, Cl. 89-33.040.
Marhold, Albrecht: *See*—
Sirrenberg, Wilhelm; Marhold, Albrecht; and Becker, Benedikt, 4,613,612, Cl. 514-456.000.
Mark Resources, Inc.: *See*—
Mitchell, Richard L., 4,613,863, Cl. 343-17.700.
Marker, Harold E.: *See*—
Walter, Robert J.; and Marker, Harold E., 4,613,388, Cl. 148-425.000.
Markezich, Ronald L., to Occidental Chemical Corporation. Fire retardant thermoplastic polyester and polyesterether compositions. 4,613,651, Cl. 525-42.000.
Markovics, James M.: *See*—
Foley, Geoffrey M. T.; Markovics, James M.; Berkes, John S.; Badesha, Santokh S.; and Abkowitz, Martin A., 4,613,557, Cl. 430-59.000.
Marotta, Vincent G.; and Komatsu, Ikuo I., to North American Systems, Inc. Electric water heating apparatus for a drip coffee maker. 4,613,745, Cl. 219-297.000.
Marraccini, Antonio; Carlini, Filippo M.; Bottaccio, Giorgio; Pasquale, Antonio; and Maranzana, Giorgio, to Montedison S.p.A. Silane diimidic tetracarboxylic perylene dyes. 4,613,667, Cl. 546-14.000.
Marshall, James B., to Westinghouse Electric Corp. Underwater discharge system. 4,613,253, Cl. 405-195.000.
Marshall, Robert C., to Nordson Corporation. Quick replaceable nozzle assembly. 4,613,078, Cl. 239-390.000.
Martens, Gerhard, to U.S. Philips Corporation. Optical pressure sensor. 4,612,810, Cl. 73-705.000.
Martin, John S., to Engineering Patents & Equipment Limited. Aircraft ejection system. 4,613,100, Cl. 244-122.0AD.
Maruko, Kinya, to Tokyo Shibaura Denki Kabushiki Kaisha. Display apparatus. 4,613,852, Cl. 340-703.000.
Maruyama, Eiichi: *See*—
Katayama, Yoshifumi; Shimada, Toshikazu; and Maruyama, Eiichi, 4,613,382, Cl. 148-1.500.
Maruyama, Kouji; Nomura, Takeshi; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins P-998. 4,613,581, Cl. 502-127.000.
Maruyama, Yutaka: *See*—
Miyake, Norihisa; Tsuchihashi, Akira; Fujiwara, Osamu; Hashimoto, Yasuhiro; and Maruyama, Yutaka, 4,613,943, Cl. 364-513.000.
Maruzeni, Shoji; Yanagihara, Toshimichi; and Yasuda, Nozomi, to Asahi Denka Kogyo Kabushiki Kaisha. Cacao butter substitutes and chocolates containing the same. 4,613,514, Cl. 426-607.000.
Maschinenfabrik Alfred Schmermund GmbH & Co.: *See*—
Knecht, Siegfried; and Wiesejahn, Jurgen, 4,613,750, Cl. 250-223.00R.
Masco Corporation: *See*—
Zanias, Theodore J.; and Fairchild, Elwood M., 4,613,297, Cl. 431-16.000.
Mase, Yasukazu; Abe, Masahiro; Aoyama, Masaharu; and Ajima, Takashi, to Kabushiki Kaisha Toshiba. Semiconductor device of multilayer wiring structure. 4,613,888, Cl. 357-54.000.
Massard, Christian; Pierre, Alain; and Roumegoux, Jean-Louis, to Essilor International Cie Generale d'Optique. Method and apparatus for bevelling or grooving ophthalmic lenses. 4,612,736, Cl. 51-284.00E.
Masters, Robert A.: *See*—
Foglesonger, John D.; and Masters, Robert A., 4,613,839, Cl. 333-239.000.
Masuda, Ikuro; Maejima, Hideo; Hayashi, Terumine; and Hatayama, Kazumi, to Hitachi, Ltd. Integrated circuit device and method of diagnosing the same. 4,613,970, Cl. 371-25.000.
Masuko, Akinori; Kuroiwa, Wataru; Shimizu, Yasufumi; and Hirosawa, Hideki, to Kabushiki Kaisha Toshiba. Frequency synthesizer for CATV tuner. 4,613,826, Cl. 331-14.000.
Masumoto, Shozoh: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.
Mathes, Nikolaus: *See*—
Gerlach, Klaus; Mathes, Nikolaus; Pitowski, Hans-Jurgen; and Wechs, Friedbert, 4,612,688, Cl. 28-104.000.
Mathias, Lon J.; and Hermes, Robert E., to University of Southern Mississippi. Vinyl monomers capable of forming side-chain liquid crystalline polymers and the resulting polymers. 4,613,658, Cl. 526-312.000.
Matras, Edmund J.: *See*—
Arnold, Ronald G.; and Matras, Edmund J., 4,612,748, Cl. 52-309.160.
Matsuda, Hideaki: *See*—
Saeki, Takashi; and Matsuda, Hideaki, 4,613,649, Cl. 524-650.000.
Matsuda, Hiromu: *See*—
Yamamoto, Hajime; Matsuda, Hiromu; Yubakami, Keiichi; and Takashima, Yuji, 4,613,555, Cl. 430-45.000.
Matsuda, Ikuo: *See*—
Tadokoro, Tomoo; Matsuda, Ikuo; and Okimoto, Haruo, 4,612,770, Cl. 60-602.000.
Matsuda, Kazuo: *See*—
Kohno, Mitsuo; Katayama, Shigeki; and Matsuda, Kazuo, 4,613,441, Cl. 210-500.360.
Matsuda, Kazuto: *See*—
Noma, Kouichi; Matsuda, Kazuto; and Sakurai, Toshio, 4,612,777, Cl. 62-247.000.
Matsumoto, Kouchi: *See*—
Yamazaki, Hiroshi; and Matsumoto, Kouchi, 4,613,377, Cl. 127-39.000.
Matsunaga, Osamu; and Kobayashi, Hiroyuki, to Sony Corporation. Digital code reading apparatus and method. 4,613,900, Cl. 358-123.000.

Matsuno, Mitsuo; Yamanashi, Teraki; Yuasa, Hitoshi; and Imai, Hirosuke, to Nippon Oil Co. Ltd. Tricyclo[2.2.1.0^{2,6}]heptane derivatives, process for preparing same, and perfume compositions containing same. 4,613,456, Cl. 252-522.00R.

Matsuo, Hisashi: *See*—
Hasegawa, Kiyoshi; Matsuo, Hisashi; and Hashimoto, Hideki, 4,613,803, Cl. 318-568.000.

Matsuo, Yukito; Tamada, Masuo; Sawafuji, Takashi; and Azukizawa, Teruo, to Kabushiki Kaisha Toshiba. Conveyor system. 4,613,805, Cl. 318-687.000.

Matsuoka, Tomizo: *See*—
Kuwata, Jun; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,613,546, Cl. 428-336.000.

Matsushima, Tadashi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.

Matsushita Electric Industrial Co., Ltd.: *See*—
Harada, Toyohei; and Tao, Muneo, 4,613,298, Cl. 431-88.000.
Kanai, Kenji; Sasaki, Seishi; Takahashi, Ken; and Sugita, Ryuji, 4,613,918, Cl. 360-113.000.
Kuwata, Jun; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,613,546, Cl. 428-336.000.
Miyatake, Norio; Uenishi, Mitsuaki; Kashimura, Nobuo; and Ishiwatari, Keizo, 4,613,919, Cl. 360-118.000.
Yamamoto, Hajime; Matsuda, Hiromu; Yubakami, Keiichi; and Takashima, Yuji, 4,613,555, Cl. 430-45.000.

Matsushita Electric Works, Ltd.: *See*—
Yabu, Hisao; Tsuji, Kenji; and Hirabayashi, Akinori, 4,613,840, Cl. 335-128.000.

Matsushita, Moe: *See*—
Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,613,591, Cl. 514-34.000.

Matsuzaki, Yoshitomi: *See*—
Hayashi, Toshihiko; and Matsuzaki, Yoshitomi, 4,612,977, Cl. 165-71.000.

Mawhinney, Daniel D.; and Milgazo, Henry F., to RCA Corporation. Fluid filled microwave cavity oscillator for a discontinuity detector system. 4,613,832, Cl. 331-96.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften: *See*—
Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, 4,613,203, Cl. 350-6.600.

Maxson, Myron T.: *See*—
Lee, Chi-long; and Maxson, Myron T., 4,613,659, Cl. 528-15.000.

Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., to Automotive Products plc. Friction clutch driven plate. 4,613,030, Cl. 192-106.200.

Mazda Motor Corporation: *See*—
Tadokoro, Tomoo; Matsuda, Ikuo; and Okimoto, Haruo, 4,612,770, Cl. 60-602.000.
Tadokoro, Tomoo; and Okimoto, Haruo, 4,612,904, Cl. 123-492.000.

Mazumder, Nikhil C., to Advanced Micro Devices, Inc. Unitary multiplexer-decoder circuit. 4,613,774, Cl. 307-463.000.

Mazzocchi, Romano: *See*—
Longi, Paolo; Giannini, Umberto; Mazzocchi, Romano; and Deluca, Domenico, 4,613,655, Cl. 526-114.000.

McCarthy, Paul R., to Almex Ticket Machine Company Limited. Ticket reading device. 4,613,747, Cl. 235-480.000.

McCharles, Donald A.: *See*—
McWilliam, Richard D.; Anderson, Andrew G.; McCharles, Donald A.; McLaren, Donald J.; and Yew, Kwang, 4,613,318, Cl. 474-74.000.

McClanahan, Richard C., to Foster Wheeler Energy Corporation. Simulator for an industrial plant. 4,613,952, Cl. 364-578.000.

McCloskey, Emily A. Figures of speech. 4,613,309, Cl. 434-170.000.

McCoy, Karen M.: *See*—
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,613,503, Cl. 424-117.000.

McDonnell Douglas Corporation: *See*—
Blood, Ernest B., 4,613,866, Cl. 343-448.000.
Palfery, Kenneth J.; Maharaj, Kenrick B.; Malcom, John S.; Puckering, Donald R.; and Wong, Kee-Shong, 4,612,697, Cl. 29-568.000.
Schimmel, Morry L., 4,612,857, Cl. 102-204.000.

McEntire, Edward E.; and Sellstrom, Kathy B., to Texaco Inc. Catalysts preparation thereof and preparation of N-substituted acrylamides therewith. 4,613,673, Cl. 556-100.000.

McGeary, Peter G., to Solitron Devices, Inc. Direct-crimp coaxial cable connector. 4,613,199, Cl. 339-177.00R.

McGill, Dennis E. Automotive console beverage container support. 4,613,048, Cl. 211-71.000.

McGregor, Harold R. Automatic bag hanging device. 4,612,965, Cl. 141-114.000.

McGunnigle, Roger J., to FWM Enterprises, Inc. Multiple format keyboard. 4,613,247, Cl. 400-486.000.

McInerney, Charles E., to Garrett Corporation, The. Turbocharger. 4,613,288, Cl. 417-407.000.

McIntyre, Douglas O.; and Limbrick, Robert W. Anchor bolt. 4,613,264, Cl. 411-55.000.

McKeough, David T.: *See*—
Chang, Wen-Hsuan; and McKeough, David T., 4,613,451, Cl. 252-182.000.

McKeown, Kevin J., to Biomass Limited. Anaerobic fermentor. 4,613,433, Cl. 210-150.000.

McKie, Derrick B., to Celanese Corporation. Low warp filled polyoxymethylene compositions. 4,613,634, Cl. 523-223.000.

McKinney, P. Jay, to Roadway Express, Inc. Dragline sweeper. 4,612,681, Cl. 15-49.00R.

McKirdy, Bruce J.; and Cooper, Ashley G., to United Kingdom Atomic Energy Authority. Contact ultrasonic probe holders. 4,612,808, Cl. 73-622.000.

McLaren, Donald J.: *See*—
McWilliam, Richard D.; Anderson, Andrew G.; McCharles, Donald A.; McLaren, Donald J.; and Yew, Kwang, 4,613,318, Cl. 474-74.000.

McManus, Bernard T. Cooking utensil. 4,612,851, Cl. 99-419.000.

McNiff, Timothy K., to British Petroleum Company p.l.c., The. Production of aromatics from ethane and/or ethylene. 4,613,716, Cl. 585-415.000.

McWilliam, Richard D.; Anderson, Andrew G.; McCharles, Donald A.; McLaren, Donald J.; and Yew, Kwang, to Canadian Fram Limited. Drive system with wear compensator. 4,613,318, Cl. 474-74.000.

Mead Corporation, The: *See*—
Nelson, Erik K.; and Head, Donald L., 4,613,742, Cl. 219-121.0LG.

Mead Johnson & Company: *See*—
Gammans, Richard E.; Smith, David W.; and Yevich, Joseph P., 4,613,600, Cl. 514-252.000.

Mechanical Technology Incorporated: *See*—
Berntell, John O., 4,612,769, Cl. 60-521.000.

Medel Medizinische Elektronik Handelsges. mbH: *See*—
Timmermann, Hartwig, 4,613,850, Cl. 340-686.000.

Medical College of Wisconsin, Inc., The: *See*—
Battocletti, Joseph H.; Halbach, Richard E.; Antonich, Frederick J.; Sances, Anthony, Jr.; and Knox, Thomas A., 4,613,818, Cl. 324-306.000.

Medical Research Associates, Ltd. #2: *See*—
Deisler, Richard J.; and Goldberg, Eugene P., 4,613,640, Cl. 524-264.000.

Medrano, Michael V. Precooler for an evaporative cooler. 4,612,778, Cl. 62-311.000.

Meguri, Nobuyasu: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.

Meierhoefer, Eugene J.: *See*—
Boiarski, Anthony A.; Fleck, Barbara H.; Meierhoefer, Eugene J.; and Razgaitis, Richard, 4,612,926, Cl. 128-200.210.

Meijer, Johan F. R., to N.K.F. Groep B.V. Method of and device for providing a concentric layer of wire material on a cable. 4,612,759, Cl. 57-17.000.

Meinkowsky, Larry J. Dispenser for snuff and the like. 4,612,943, Cl. 131-329.000.

Mela, Martti. Method and apparatus for manufacturing a heater. 4,613,390, Cl. 156-177.000.

Mellentin, Stephen W.: *See*—
Hood, Thomas G.; Vincent, Steve M.; and Mellentin, Stephen W., 4,613,530, Cl. 428-34.000.

Melton, Lynn A., to United Technologies Corporation. Method for determining the temperature of a fluid. 4,613,237, Cl. 374-162.000.

Memtec Limited: *See*—
Ford, Douglas L., 4,613,625, Cl. 521-53.000.

Menge, Wilhelm. Method for making an acidic fermenting dough for the preparation of bread and bakery products, using waste bread. 4,613,506, Cl. 426-18.000.

Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Heilbach, Hans, to BASF Aktiengesellschaft. Preparation of hexamethylene 1,6-diisocyanate and/or isomeric diisocyanates where alkylene is of 6 carbon atoms. 4,613,466, Cl. 560-344.000.

Merkel, Stephen L., to Nordson Corporation. Pressure pulse masking circuit for a pressure monitor in a dispensing system. 4,613,059, Cl. 222-52.000.

Merl, Wilhelm A.: *See*—
Held, Manfred; Leidig, Alfred; Merl, Wilhelm A.; and Stempel, Gunter, 4,613,370, Cl. 75-248.000.

Mertz, Denny W., to Emerson Electric Co. Selectively variable flow-rate expansion apparatus. 4,612,783, Cl. 62-528.000.

Meshreki, Makram H.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,613,638, Cl. 524-109.000.

Messerschmitt-Bolkow Blohm GmbH: *See*—
Held, Manfred; Leidig, Alfred; Merl, Wilhelm A.; and Stempel, Gunter, 4,613,370, Cl. 75-248.000.

Messinger, Elmar K., to 501 Olympus Corporation. Portable fiberoptic light source for use in hazardous locations. 4,613,931, Cl. 362-373.000.

Mestre, Michel A. P.: *See*—
Gueremy, Claude G. A.; Mestre, Michel A. P.; and Renault, Christian L. A., 4,613,607, Cl. 514-314.000.

Metzeler Kautschuk GmbH: *See*—
Andra , Rainer; and Hofmann, Manfred, 4,613,117, Cl. 267-140.100.

Meuresch, Herbert; and Fuhrig, Wolfgang, to Deutsche Prazisions-Ventil GmbH. Valve fitment for a two-chamber compressed gas packaging means. 4,613,061, Cl. 222-82.000.

Mey, Klaus-Peter: *See*—
Henrich, Gunter; Hoffmann, Harald; Waldhecker, Heinz-Dieter; and Mey, Klaus-Peter, 4,613,344, Cl. 48-77.000.

Meyer, Klaus; and vom Hofe, Dieter, to Henkel Kommanditgesellschaft auf Aktien. Tilting dispenser. 4,613,064, Cl. 222-456.000.

Meyer, Stanley A. Gas electrical hydrogen generator. 4,613,304, Cl. 431-354.000.

Meyer, Stanley A. Electrical pulse generator. 4,613,779, Cl. 310-112.000.
Michel, Klaus; and Gude, Armin, to Chemische Werke Huls AG. Dimensionally stable shaped hollow sections from aliphatic polyamides and their applications. 4,613,532, Cl. 428-36.000.
Michelson, Paul E. Delivery system for desired agents. 4,613,330, Cl. 604-890.000.
Michno, Michael J., Jr.: *See*—
Robeson, Lloyd M.; Harris, James E.; and Michno, Michael J., Jr., 4,613,645, Cl. 524-443.000.
Micro Consultants Limited: *See*—
Walker, Ian C., 4,613,857, Cl. 340-724.000.
Midland-Ross Corporation: *See*—
Higgins, Robert G., 4,612,746, Cl. 52-221.000.
Migrin, Robert S.; and Tinder, David V., to United Technologies Automotive, Inc. Delay wiper switch. 4,613,733, Cl. 200-5.00R.
Mikroyannidis, Ioannis A.: *See*—
Tsolis, Alexandros K.; and Mikroyannidis, Ioannis A., 4,613,674, Cl. 558-161.000.
Mikuni Kogyo Kabushiki Kaisha: *See*—
Kikuchi, Kunio; and Umehara, Hidetoshi, 4,613,072, Cl. 237-12.30C.
Milberger, Lionel J.: *See*—
Hughes, David W.; and Milberger, Lionel J., 4,613,164, Cl. 285-27.000.
Milgazo, Henry F.: *See*—
Mawhinney, Daniel D.; and Milgazo, Henry F., 4,613,832, Cl. 331-96.000.
Millay, Lawrence I.; and Dzewaltowski, Victor F., to Ex-Cell-O Corporation. Drill bit lug fixture. 4,612,735, Cl. 51-217.00R.
Miller, Donald F., to Du Pont de Nemours, E. I., and Company. Apparatus for cutting filamentary material. 4,612,842, Cl. 83-24.000.
Miller, Evan R.: *See*—
Burd, Lamar; Miller, Evan R.; Carozza, Eugene J.; and Grunstra, Robert E., 4,612,969, Cl. 164-122.200.
Miller, Francis G. Froth flotation separation method and apparatus. 4,613,430, Cl. 209-167.000.
Miller, Francis G. Froth flotation separation apparatus. 4,613,431, Cl. 209-169.000.
Miller, Gabriel: *See*—
Corren, Dean R.; and Miller, Gabriel, 4,613,279, Cl. 415-2.00A.
Miller, Kevin P.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,613,511, Cl. 426-535.000.
Miller, Lawrence R., to Siemens Medical Laboratories, Inc. Ultrasound diagnostic apparatus. 4,612,937, Cl. 128-663.000.
Miller, Russell S.: *See*—
Dietz, Peter W.; and Miller, Russell S., 4,613,076, Cl. 239-3.000.
Millet, Serge D. Oil changing and lubricating apparatus. 4,613,014, Cl. 184-1.500.
Minakata, Ryosuke: *See*—
Saito, Ikuo; Minakata, Ryosuke; and Suzuki, Yukio, 4,613,044, Cl. 206-444.000.
Mini Base Systems, Inc.: *See*—
Drapp, Donald J.; and Cabler, Paul S., 4,613,349, Cl. 55-458.000.
Minnesota Mining and Manufacturing Co.: *See*—
Burleigh, Malcolm B., 4,613,544, Cl. 428-315.500.
Cavanagh, Michael J., 4,612,755, Cl. 53-485.000.
Forester, Roger J.; and White, Lloyd R., 4,613,350, Cl. 65-2.000.
Mirviss, Stanley B., to Stauffer Chemical Company. One-step hydrogenation/esterification of benzyloxy phenoxy propanoic acid. 4,613,677, Cl. 560-61.000.
Mirviss, Stanley B.; and Empie, Mark W., to Stauffer Chemical Company. Preparation of amino acids from unsaturated hydantoins. 4,613,691, Cl. 562-443.000.
Misumi, Teruo: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,613,558, Cl. 430-84.000.
Mitchell, David N.: *See*—
Dewing, Ernest W.; Gesing, Adam J.; Mitchell, David N.; and Pant, Aniket, 4,613,418, Cl. 204-243.00R.
Mitchell, Larry D., to Amedco Health Care Inc. Bed side guard assembly. 4,612,679, Cl. 5-425.000.
Mitchell, Richard L., to Mark Resources, Inc. Electronic augmentation of radar targets. 4,613,863, Cl. 343-17.700.
Mitono, Yoshiharu: *See*—
Fukuda, Takeshi; Mitono, Yoshiharu; and Kiriseko, Tadashi, 4,613,887, Cl. 357-43.000.
Mitsu Norin Co., Ltd.: *See*—
Hara, Yukihiko, 4,613,672, Cl. 549-399.000.
Mitsubishi Chemical Industries Limited: *See*—
Fukami, Harukazu; Inoue, Shinya; Nitta, Issei; Nakao, Kenichiro; and Kikumoto, Ryoji, 4,613,598, Cl. 514-211.000.
Maki, Takao; and Yokoyama, Toshiharu, 4,613,700, Cl. 568-435.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Honjoh, Yoshihisa; and Okuda, Hiroshi, 4,612,899, Cl. 123-413.000.
Isoda, Satoru, 4,613,541, Cl. 428-212.000.
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,612,900, Cl. 123-425.000.
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,612,901, Cl. 123-425.000.
Miyoshi, Tatuo; Uno, Jyoji; and Iwamatsu, Kouji, 4,613,301, Cl. 431-259.000.
Okahashi, Kazuo; Hayashi, Osamu; Ishii, Isao; and Kobayashi, Toshiyuki, 4,613,167, Cl. 285-54.000.
Tanaka, Toshinori; and Morishita, Akira, 4,613,007, Cl. 180-89.150.
Yabunaka, Kiyoshi, 4,613,761, Cl. 290-36.00R.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Aoyama, Tetsuo; Kida, Koichi; and Uchiyama, Takako, 4,613,684, Cl. 560-179.000.
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,613,154, Cl. 280-707.000.
Mitsubishi Jukoygo Kabushiki Kaisha: *See*—
Okamoto, Toshiro; and Ohshima, Michio, 4,613,426, Cl. 208-107.000.
Mitsubishi Mining & Cement Co., Ltd.: *See*—
Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, 4,613,577, Cl. 501-35.000.
Mitsubishi Paper Mills Ltd.: *See*—
Miyamoto, Shigehiko; and Yamasaki, Takeshi, 4,613,525, Cl. 427-256.000.
Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See*—
Oguri, Tomei; Morinaka, Yasuhiro; and Kadowaki, Shuichiro, 4,613,613, Cl. 514-461.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.
Mitsui, Hiromitsu: *See*—
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.
Mitter, Mathias, to Ramisch Kleinewefers. Apparatus for applying flowable media to webs of textile material or the like. 4,612,874, Cl. 118-410.000.
Miura, Nobuo: *See*—
Sakata, Norihiko; and Miura, Nobuo, 4,613,626, Cl. 521-60.000.
Miura, Tatsuhiko: *See*—
Nakamura, Kenji; and Miura, Tatsuhiko, 4,613,009, Cl. 180-253.000.
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, to Sankyo Company Limited. Penem derivatives, and composition containing them. 4,613,595, Cl. 514-195.000.
Miyagawa, Kazuo: *See*—
Ushigoe, Tomio; Kobayashi, Takeo; Yoshinaga, Yoshitsugu; Tsuchiya, Keiro; and Miyagawa, Kazuo, 4,612,832, Cl. 82-3.000.
Miyake, Hiroyuki; and Yonemori, Takaji, to Canon Kabushiki Kaisha. Cleaning apparatus. 4,613,229, Cl. 355-15.000.
Miyake, Norihisa; Tsuchihashi, Akira; Fujiwara, Osamu; Hashimoto, Yasuhiro; and Maruyama, Yutaka, to Hitachi, Ltd. Operation teaching method and apparatus for industrial robot. 4,613,943, Cl. 364-513.000.
Miyamoto, Kenzo: *See*—
Sekiya, Masayoshi; Ishizuka, Toshiro; Maeda, Daiharu; Miyamoto, Kenzo; and Shimazoe, Takahiro, 4,613,650, Cl. 524-828.000.
Miyamoto, Seigo: *See*—
Yanadori, Michio; Kawano, Tomohiro; Miyamoto, Seigo; Nara, Yasuaki; and Oguri, Masahiro, 4,612,974, Cl. 165-10.000.
Miyamoto, Shigehiko; and Yamasaki, Takeshi, to Mitsubishi Paper Mills Ltd. Ink-jet recording medium. 4,613,525, Cl. 427-256.000.
Miyatake, Norio; Uenishi, Mitsuaki; Kashimura, Nobuo; and Ishiwatari, Keizo, to Matsushita Electric Industrial Co., Ltd. Magnetic erasing head. 4,613,919, Cl. 360-118.000.
Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,613,467, Cl. 260-543.00F.
Miyoshi, Tatuo; Uno, Jyoji; and Iwamatsu, Kouji, to Mitsubishi Denki Kabushiki Kaisha. Ignition device. 4,613,301, Cl. 431-259.000.
Mizoguchi, Masafumi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.
Mizunoe, Katsumi: *See*—
Inoue, Yukio; and Mizunoe, Katsumi, 4,613,962, Cl. 369-44.000.
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, to Green Cross Corporation, The; and Kaken Pharmaceutical Co., Ltd. Ester of flurbiprofen and emulsion containing the same. 4,613,505, Cl. 424-80.000.
MKT-Tehtaat Oy: *See*—
Kostiainen, Lauri; and Kauppi, Heikki, 4,612,853, Cl. 99-461.000.
Mobil Oil Corporation: *See*—
Bridger, Robert F., 4,613,712, Cl. 585-10.000.
Costello, Walter H., 4,612,959, Cl. 137-828.000.
Espenscheid, Wilton F., deceased; and Paul, James M., 4,613,631, Cl. 523-130.000.
Hinkley, David; and Pann, Keh, 4,613,960, Cl. 367-51.000.
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., 4,613,343, Cl. 44-71.000.
Maddock, Robert T., 4,613,988, Cl. 383-8.000.
Shu, Winston R., 4,612,990, Cl. 166-272.000.

Wagner, John R., Jr.; and Clauson, Melvil B., 4,613,547, Cl. 428-349.000.
Mobil Solar Energy Corporation: *See*—
Gonsiorawski, Ronald C.; and Yates, Douglas A., 4,612,698, Cl. 29-572.000.
Moeller, Hinrich; and Wallat, Siegfried, to Henkel Kommanditgesellschaft auf Aktien. Sebosuppressive preparations containing benzyl alcohol derivatives. 4,613,622, Cl. 514-718.000.
Moerder, Karl E.: *See*—
Gilhousen, Klein S.; Newby, Charles F., Jr.; and Moerder, Karl E., 4,613,901, Cl. 358-122.000.
Mohr, Karl; and Mohr, Wolfgang. Device for the intermediate stacking of material that is to be cut. 4,613,267, Cl. 414-37.000.
Mohr, Paul H.: *See*—
Haack, John L.; and Mohr, Paul H., 4,613,445, Cl. 252-75.000.
Mohr, Siegfried H., to NCR Corporation. Laser recording system. 4,613,876, Cl. 346-160.000.
Mohr, Wolfgang: *See*—
Mohr, Karl; and Mohr, Wolfgang, 4,613,267, Cl. 414-37.000.
Mohri, Akira; and Oyama, Akira, to Murata Manufacturing Co., Ltd. Sensor attachment assembly. 4,613,925, Cl. 361-420.000.
Molinatto, Bruno, to Componenti Grafici s.r.l. Pressure cylinder with variable configuration axis. 4,612,692, Cl. 29-116.0AD.
Mong, William K.: *See*—
Hart, James E.; Mong, William K.; Kyllonen, Allen W.; and Krampitz, Mark S., 4,613,016, Cl. 188-52.000.
Montedison S.p.A.: *See*—
Longi, Paolo; Giannini, Umberto; Mazzocchi, Romano; and Deluca, Domenico, 4,613,655, Cl. 526-114.000.
Marraccini, Antonio; Carlini, Filippo M.; Bottaccio, Giorgio; Pasquale, Antonio; and Maranzana, Giorgio, 4,613,667, Cl. 546-14.000.
Pagani, Giorgio, 4,613,697, Cl. 564-67.000.
Montgomery, David: *See*—
Williams, Joel L.; Dunn, Terry S.; O'Connell, James P.; and Montgomery, David, 4,613,517, Cl. 427-2.000.
Montgomery, Jane G.: *See*—
Foerster, Gerhard, 4,613,196, Cl. 339-97.00P.
Moore, Boyd B., to Shell Oil Company. Riser position indication apparatus. 4,612,993, Cl. 166-335.000.
Moore, Raymond J. Apparatus for fastening misaligned structural members. 4,613,000, Cl. 173-163.000.
Morales Ruiz, Alfredo: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, to Union Chimique et Industrielle de l'Ouest. Anticorrosion means and compositions containing same. 4,613,450, Cl. 252-181.000.
Moreinis, Gregory E.: *See*—
Munroe, Ronald G.; and Moreinis, Gregory E., 4,613,197, Cl. 339-99.00R.
Morgan, Michael A.: *See*—
Mort, Joseph; Jansen, Frank; Okumura, Koji; Grammatica, Steven J.; and Morgan, Michael A., 4,613,556, Cl. 430-57.000.
Morgan, Thomas K., Jr.: *See*—
Diamond, Julius; Lumma, William C., Jr.; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,613,609, Cl. 514-396.000.
Mori, Akira: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.
Mori, Hiroki, to Ilios Corporation of Japan. Solar energy collector array. 4,612,913, Cl. 126-438.000.
Mori, Kei. Plant cultivating device. 4,612,726, Cl. 47-66.000.
Mori, Kenji; and Ogiso, Toshio, to Hitachi, Ltd. Actuator. 4,613,782, Cl. 310-323.000.
Mori, Toshihiro, to NEC Corporation. Pager receiver selectively changeable between call number reception and message reception. 4,613,859, Cl. 340-825.440.
Moriguchi, Soyao: *See*—
Inoue, Chozo; Kurima, Yoshiko; and Moriguchi, Soyao, 4,613,688, Cl. 562-401.000.
Morihiro, Shinji, to Nissan Motor Co., Ltd. Cardan universal joints. 4,613,317, Cl. 464-131.000.
Morimoto, Masafumi: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,613,944, Cl. 364-513.500.
Morimoto, Shiro, to Osaka Titanium Co., Ltd. Process for the disproportionation of chlorosilanes. 4,613,489, Cl. 423-342.000.
Morinaga & Co., Ltd.: *See*—
Shishido, Toshihiko, 4,613,508, Cl. 426-281.000.
Morinaka, Yasuhiro: *See*—
Oguri, Tomei; Morinaka, Yasuhiro; and Kadowaki, Shuichiro, 4,613,613, Cl. 514-461.000.
Morino, Daizo: *See*—
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, 4,613,608, Cl. 514-357.000.
Morishita, Akira: *See*—
Tanaka, Toshinori; and Morishita, Akira, 4,613,007, Cl. 180-89.150.
Morita, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Fluid-sealed engine mounting. 4,613,118, Cl. 267-140.100.
Morita, Kousaku: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, 4,613,879, Cl. 346-209.000.
Morita, Toshiki: *See*—
Sugiura, Toshiro; Morita, Toshiki; and Takenaka, Koichi, 4,613,246, Cl. 400-320.000.
Moritani, Tohei; and Ikari, Kyoichiro, to Kuraray Co., Ltd. Resinous composition. 4,613,644, Cl. 524-430.000.
Moriyoshi, Hattori. Double-opening device of automobile doors. 4,612,728, Cl. 49-193.000.
Moroni, Adolfo, to Magis Farmaceutrici s.r.l. Amino methyl furans and pharmaceutical compositions. 4,613,596, Cl. 514-210.000.
Moroni, Adolfo, to Magis Farmaceutici s.r.l. Ranitidine derivative useful in the treatment of ulcer. 4,613,602, Cl. 514-252.000.
Morris, Robert L., II; and Nichols, Franklin C., to Pente Games, Inc. Folding case. 4,613,040, Cl. 206-315.100.
Morrissette, Douglas: *See*—
Berg, Robin L.; Morrissette, Douglas; and Ecker, Walter, 4,613,174, Cl. 292-136.000.
Morrissey, Donna M.: *See*—
Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., 4,613,576, Cl. 436-548.000.
Mort, Joseph; Jansen, Frank; Okumura, Koji; Grammatica, Steven J.; and Morgan, Michael A., to Xerox Corporation. Heterogeneous electrophotographic imaging members of amorphous silicon and silicon oxide. 4,613,556, Cl. 430-57.000.
Moss, Alvin; Shepherd, Charles G.; Malcolm, Craig G.; Malcolm, Richard E.; and Schmitz, Peter J. Endless belt driven cycle. 4,613,006, Cl. 180-9.250.
Motoori, Ryuzo: *See*—
Tanaka, Hiroaki; and Motoori, Ryuzo, 4,613,906, Cl. 358-183.000.
Motoren-Werke Mannheim AG, vorm. Benz Stat. Motorenba: *See*—
Dietrich, Werner; and Kinzel, Richard, 4,612,905, Cl. 123-575.000.
Motorola, Inc.: *See*—
Bickley, Robert H.; and Broughton, Christopher D., 4,613,825, Cl. 331-4.000.
Edwards, Arthur J., 4,613,808, Cl. 322-99.000.
Severson, Gerald R.; and Wade, Richard C., 4,613,735, Cl. 200-158.000.
Moulin, Jean-Francois: *See*—
Delattre, Luc; Moulin, Jean-Francois; and Badin, Suzan, 4,612,732, Cl. 51-101.0LG.
MTA Kozponti Kemiai Kutato Intezet: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.
MTU: *See*—
Eder, Wolf-Dieter, 4,612,766, Cl. 60-261.000.
Muchowski, Joseph M.: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,613,606, Cl. 514-307.000.
Mueller, John B., III, to Little Screamer Group Limited, The. Article of rolled form. 4,613,012, Cl. 181-178.000.
Mueller, William P., to Nordson Corporation. Apparatus for applying a protective coating to inner body cavities of vehicles. 4,613,528, Cl. 427-421.000.
Mulder, Douglas C.; and O'Ryan, David E., to Nordson Corporation. Adjustable powder spray gun. 4,613,083, Cl. 239-707.000.
Mulgrew, Thomas M., Jr.: *See*—
Wendell, David; and Mulgrew, Thomas M., Jr., 4,613,538, Cl. 428-198.000.
Munnekehoff, Gerd, to Barmag Barmer Maschinenfabrik AG. Yarn winding apparatus. 4,613,089, Cl. 242-18.0DD.
Munroe, Ronald G.; and Moreinis, Gregory E., to Eagle Electric Mfg. Co., Inc. Rapid assembly electrical plug. 4,613,197, Cl. 339-99.00R.
Murai, Ashita, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,613,563, Cl. 430-523.000.
Murakami, Manabu: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,613,510, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,613,511, Cl. 426-535.000.
Muraoka, Akihiko: *See*—
Hiraiwa, Kazuyoshi; and Muraoka, Akihiko, 4,613,008, Cl. 180-247.000.
Muraoka, Tsutomu: *See*—
Tsuge, Hiroshi; Fujiwara, Akinori; Iwasa, Hiroki; Nagasaka, Chikao; and Muraoka, Tsutomu, 4,613,188, Cl. 297-250.000.
Murase, Shoji: *See*—
Yamazaki, Toshihiko; Murase, Shoji; Suzuki, Katsuyuki; and Iwatsuki, Makoto, 4,613,359, Cl. 71-122.000.
Murat, Jacques: *See*—
Herbec, Jean-Pierre; Laisney, Michel; Murat, Jacques; and Serpeau, Patrick, 4,613,216, Cl. 350-618.000.
Murata Giken Kabushiki Kaisha: *See*—
Yoshimoto, Yoshio; Washio, Michiyoshi; and Yazaki, Chikayoshi, 4,613,907, Cl. 358-257.000.

Murata Kikai Kabushiki Kaisha: *See*—
Kiriake, Masaharu, 4,613,091, Cl. 242-35.50A.
Murata Manufacturing Co., Ltd.: *See*—
Mohri, Akira; and Oyama, Akira, 4,613,925, Cl. 361-420.000.
Wada, Hidekazu; and Ishikawa, Youhei, 4,613,838, Cl. 333-232.000.
Murata, Masatsune: *See*—
Omura, Satoshi; Tanaka, Haruo; Hinotozawa, Kiyoizumi; Murata, Masatsune; and Iwai, Yuzuru, 4,613,355, Cl. 71-86.000.
Murata, Masayasu: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.
Murata, Yukio: *See*—
Suzuka, Masakazu; Ohashi, Hiromu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,613,947, Cl. 364-526.000.
Murray, Lawrence K., to Phillips Petroleum Company. Apparatus and method for drying particulate material. 4,612,711, Cl. 34-39.000.
Mutschall, Hugo: *See*—
Focke, Heinz; and Mutschall, Hugo, 4,613,033, Cl. 198-457.000.
N.K.F. Groep B.V.: *See*—
Meijer, Johan F. R., 4,612,759, Cl. 57-17.000.
N. V. Bekaert S. A.: *See*—
De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, 4,612,792, Cl. 72-183.000.
Naab, Jakob, to Zoller-Kipper GmbH. Universal device to empty different-style garbage containers. 4,613,271, Cl. 414-303.000.
Nabel, Gary: *See*—
Cantor, Harvey I.; and Nabel, Gary, 4,613,459, Cl. 530-351.000.
Nabeta, Kiichiro: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.
Nabisco Brands, Inc.: *See*—
Hussein, Mamoun M., 4,613,513, Cl. 426-651.000.
Nadan, Joseph S., to North American Philips Corporation. High-resolution television transmission system. 4,613,903, Cl. 358-141.000.
Nagai, Tsuneji: *See*—
Suzuki, Yoshiki; Sekine, Kunio; Nagai, Tsuneji; Nambu, Naoki; and Nishimoto, Yuji, 4,613,500, Cl. 429-85.000.
Nagai, Yasushi: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Speed change device for a bicycle. 4,613,319, Cl. 474-80.000.
Nagasaka, Chikao: *See*—
Tsuge, Hiroshi; Fujiwara, Akinori; Iwasa, Hiroki; Nagasaka, Chikao; and Muraoka, Tsutomu, 4,613,188, Cl. 297-250.000.
Nagasaka, Yasumasa, to Toyota Jidosha Kabushiki Kaisha. Device for tightening a coil on a cylindrical body. 4,613,296, Cl. 425-547.000.
Nagashima, Eiji: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,612,838, Cl. 84-1.010.
Naguib, Fardos N. M.: *See*—
Chu, Shih H.; Calabresi, Paul; Chu, Ming Y. W.; el Kouni, Mahmoud H.; Naguib, Fardos N. M.; and Cha, Sungman, 4,613,604, Cl. 514-274.000.
Nagura, Riichi: *See*—
Kuwano, Ryushi; and Nagura, Riichi, 4,613,899, Cl. 358-88.000.
Nagy, Ferenc: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.
Naito, Hiroyuki; and Tohara, Masahiro, to Kabushiki Kaisha Toshiba. Recorder for side-by-side digital recording of analog data and digital data. 4,613,872, Cl. 346-1.100.
Naito, Youichiro: *See*—
Fukaya, Chikara; Naito, Youichiro; and Yokoyama, Kazumasa, 4,613,614, Cl. 514-469.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.
Nakagawa, Alvin H.: *See*—
Thomas, Gareth; and Nakagawa, Alvin H., 4,613,385, Cl. 148-12.00B.
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Hydrogenated amorphous silicon photosensitive method for electrophotography. 4,613,558, Cl. 430-84.000.
Nakai, Shoji; and Akimoto, Koji, to Kamitsu Seisakusho Ltd. Spindle assembly for winding machine. 4,613,092, Cl. 242-46.400.
Nakajima, Hitoshi: *See*—
Ishida, Hiroshi; and Nakajima, Hitoshi, 4,613,717, Cl. 585-467.000.
Nakajima, Kenji: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.
Nakajima, Motoharu; Sakane, Seishiro; Sato, Norimichi; and Haruta, Etsuro, to Shinko Electric Co., Ltd.; and Nippon Kokan Kabushiki Kaisha. Grinding machine. 4,612,734, Cl. 51-170.0PT.
Nakamoto, Kouji: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.
Nakamura, Kenji; and Miura, Tatsuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Wheel supporting structure for riding type working vehicles. 4,613,009, Cl. 180-253.000.
Nakamura, Kenji: *See*—
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,613,153, Cl. 280-689.000.
Nakamura, Masato; and Kamioka, Takashi, to Kanzaki Paper Mfg. Co., Ltd. Method of producing coated paper. 4,613,526, Cl. 427-356.000.
Nakamura, Mitsuru: *See*—
Sato, Eiji; Fukuda, Tamio; Ishii, Masaharu; Nakamura, Mitsuru; and Nakamura, Yozo, 4,613,285, Cl. 417-214.000.
Nakamura, Norihiko, to Rhythm Watch Co., Ltd. Double pendulum clock. 4,613,236, Cl. 368-165.000.
Nakamura, Shunichi; Okamura, Kenji; Kaneko, Shingo; and Sumi, Kiyoshi, to Tokuyama Soda Kabushiki Kaisha. Porous sheet. 4,613,643, Cl. 524-426.000.
Nakamura, Yoshiyuki: *See*—
Takamori, Tsutomu; Nakamura, Yoshiyuki; and Abe, Hitoshi, 4,613,827, Cl. 331-20.000.
Nakamura, Yozo: *See*—
Sato, Eiji; Fukuda, Tamio; Ishii, Masaharu; Nakamura, Mitsuru; and Nakamura, Yozo, 4,613,285, Cl. 417-214.000.
Nakanishi, Tosaku: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,613,944, Cl. 364-513.500.
Nakano, Rieko: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.
Nakano, Shoichi: *See*—
Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, 4,613,880, Cl. 357-2.000.
Nakao, Kenichiro: *See*—
Fukami, Harukazu; Inoue, Shinya; Nitta, Issei; Nakao, Kenichiro; and Kikumoto, Ryoji, 4,613,598, Cl. 514-211.000.
Nakayama, Takeo; Fujinami, Kimiya; Sakamoto, Takurou; and Doura, Fumihiro, to Takeda Chemical Industries, Inc. Curable resin compositions. 4,613,652, Cl. 525-276.000.
Nalco Chemical Company: *See*—
Keiser, Bruce A., 4,613,454, Cl. 252-313.200.
Nambu, Naoki: *See*—
Suzuki, Yoshiki; Sekine, Kunio; Nagai, Tsuneji; Nambu, Naoki; and Nishimoto, Yuji, 4,613,500, Cl. 429-85.000.
Nanri, Masahiko: *See*—
Ikeda, Yoshiaki; Tamura, Yoshio; Nanri, Masahiko; and Onizuka, Yasuki, 4,613,245, Cl. 400-313.000.
Naokawa, Toyojiro: *See*—
Gross, William H.; and Naokawa, Toyojiro, 4,613,769, Cl. 307-351.000.
Nara, Yasuaki: *See*—
Yanadori, Michio; Kawano, Tomohiro; Miyamoto, Seigo; Nara, Yasuaki; and Oguri, Masahiro, 4,612,974, Cl. 165-10.000.
Narechania, Rajesh G.: *See*—
Bruce, James A.; and Narechania, Rajesh G., 4,612,805, Cl. 73-150.00A.
Narita, Tadashi; Hagiwara, Tokio; and Hamana, Hiroshi, to Central Glass Company, Limited. Method for anionic homopolymerization of α-trifluoromethylacrylate. 4,613,657, Cl. 526-204.000.
Naruto, Masanobu; Kondo, Hisao; and Hata, Go, to Toray Industries, Inc. Preparation of angelic acid or esters thereof. 4,613,680, Cl. 560-205.000.
Naselow, Arthur B.: *See*—
Landis, Abraham L.; and Naselow, Arthur B., 4,613,637, Cl. 524-105.000.
Nash Engineering Company, The: *See*—
Haavik, Harold K., 4,613,283, Cl. 417-68.000.
Natale, Anthony. Disposable HEPA filtration device. 4,613,348, Cl. 55-318.000.
National Semiconductor Corporation: *See*—
Gross, William H.; and Naokawa, Toyojiro, 4,613,769, Cl. 307-351.000.
Skovmand, Timothy J., 4,613,809, Cl. 323-268.000.
NCR Canada Ltd.: *See*—
Ataman, Ergin; and King, J. Thomas, 4,613,986, Cl. 382-54.000.
NCR Corporation: *See*—
Bush, John M.; and Ruhberg, David L., 4,613,953, Cl. 364-900.000.
Mohr, Siegfried H., 4,613,876, Cl. 346-160.000.
Wishart, Scott A.; Pecak, Tadeusz; Wilson, Owen H.; and Boon, Anthony J., 4,613,127, Cl. 271-274.000.
NEC Corporation: *See*—
Aoyagi, Hidehito; and Hirosaki, Botaro, 4,613,975, Cl. 375-40.000.
Kitagawa, Kunio, 4,613,241, Cl. 400-121.000.
Kuwano, Ryushi; and Nagura, Riichi, 4,613,899, Cl. 358-88.000.
Mori, Toshihiro, 4,613,859, Cl. 340-825.440.
Oida, Osamu, 4,613,794, Cl. 315-169.400.

Neff Gewindespindeln GmbH: *See*—
Neff, Karl, 4,612,817, Cl. 74-424.8NA.
Neff, Karl, to Neff Gewindespindeln GmbH. Circulating ball worm drive. 4,612,817, Cl. 74-424.8NA.
Nelson, Bascom M. Locking device for closures. 4,613,175, Cl. 292-148.000.
Nelson, Erik K.; and Head, Donald L., to Mead Corporation, The. Method for cutting imaging sheets containing photosensitive microcapsules. 4,613,742, Cl. 219-121.0LG.
Nelson Industries, Inc.: *See*—
Kersting, Darrel, 4,613,170, Cl. 285-187.000.
Nelson, Mark L.: *See*—
Nelson, Otis L., Jr.; and Nelson, Mark L., 4,613,340, Cl. 44-53.000.
Nelson, Otis L., Jr.; and Nelson, Mark L., to Polar Molecular Corp. Residual oil sludge dispersant. 4,613,340, Cl. 44-53.000.
Neo Vac Aktiengesellschaft: *See*—
Bachmann, Werner, 4,613,922, Cl. 361-215.000.
Neret, Jean-Louis: *See*—
Pelloux-Gervais, Pierre; and Neret, Jean-Louis, 4,612,773, Cl. 62-50.000.
Nespoli, Guido: *See*—
Gunter, Wolfgang; and Nespoli, Guido, 4,613,923, Cl. 361-315.000.
Nestler, Gerhard: *See*—
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Hellbach, Hans, 4,613,466, Cl. 560-344.000.
Neuhold, Arnold; and Pohl, Claus, to Geimuplast Peter Mundt GmbH & Co. KG. Method of inserting a slide into a frame. 4,612,754, Cl. 53-457.000.
Neukermans, Armand P.: *See*—
Siddall, Graham J.; Eaton, Steven G.; Kruger, James B.; Garrettson, Garrett A.; and Neukermans, Armand P., 4,613,981, Cl. 378-34.000.
Neumann, Peter: *See*—
Thomas, Michael; Neumann, Peter; Wegerle, Dieter; and Krallmann, Reinhold, 4,613,334, Cl. 8-442.000.
Neumeier, Leander A.: *See*—
Falke, Wilbert L.; Lee, Agnes Y.; and Neumeier, Leander A., 4,613,069, Cl. 228-211.000.
Neumeyer, Stefan. Dental tool. 4,613,307, Cl. 433-166.000.
New Holland Inc.: *See*—
Wagstaff, Robert A.; and Glass, Emmett F., 4,612,855, Cl. 100-5.000.
New York Blood Center, Inc.: *See*—
Horowitz, Bernard, 4,613,501, Cl. 424-89.000.
Newby, Charles F., Jr.: *See*—
Gilhousen, Klein S.; Newby, Charles F., Jr.; and Moerder, Karl E., 4,613,901, Cl. 358-122.000.
Newlin, Larry L.; and Chapman, William L., to Conoco Inc. System for high accuracy remote decoding. 4,613,980, Cl. 375-116.000.
Newnham, Robert E.: *See*—
Haun, Michael J.; Newnham, Robert E.; and Schulze, Walter A., 4,613,784, Cl. 310-358.000.
Ng, Kwok K.; and Sze, Simon M., to AT&T Bell Laboratories. Packaging microminiature devices. 4,613,891, Cl. 357-68.000.
Nichols, Franklin C.: *See*—
Morris, Robert L., II; and Nichols, Franklin C., 4,613,040, Cl. 206-315.100.
Nickels, Helmut: *See*—
Rebafka, Walter; and Nickels, Helmut, 4,613,683, Cl. 560-67.000.
Niebylski, Leonard M.: *See*—
Zaweski, Edward F.; and Niebylski, Leonard M., 4,613,341, Cl. 44-57.000.
Nied, Herman A.; and Baheti, Radhakisan S., to General Electric Company. Arc welding adaptive process control system. 4,613,743, Cl. 219-130.210.
Nihei, Nobuyuki: *See*—
Chubachi, Ryoji; and Nihei, Nobuyuki, 4,613,545, Cl. 428-328.000.
Nikki-Universal Co., Ltd.: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,613,585, Cl. 502-355.000.
Nikkodo Co., Ltd.: *See*—
Saito, Ikuo; Minakata, Ryosuke; and Suzuki, Yukio, 4,613,044, Cl. 206-444.000.
Nilsson, Jan-Ake I.; and Hansson, Bengt L., to Rippelton N.V. Apparatus for the combustion of solid fuels. 4,612,865, Cl. 110-244.000.
Nilsson, Nils-Olov; Andersson, Ingmar; Sandberg, Ulrik; and Karlsson, Eils, to Laxa Bruk AB. Asphalt surfacing mass. 4,613,376, Cl. 106-282.000.
Nippon Kogaku K. K.: *See*—
Ogasawara, Akira, 4,613,224, Cl. 354-402.000.
Nippon Kogaku K.K.: *See*—
Frohbach, Hugh F., 4,613,759, Cl. 250-566.000.
Inoue, Yukio; and Mizunoe, Katsumi, 4,613,962, Cl. 369-44.000.
Tanaka, Hiroaki; and Motoori, Ryuzo, 4,613,906, Cl. 358-183.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nakajima, Motoharu; Sakane, Seishiro; Sato, Norimichi; and Haruta, Etsuro, 4,612,734, Cl. 51-170.0PT.
Nippon Oil Co. Ltd.: *See*—
Matsuno, Mitsuo; Yamanashi, Teraki; Yuasa, Hitoshi; and Imai, Hirosuke, 4,613,456, Cl. 252-522.00R.
Nippon Paint Co., Ltd.: *See*—
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.
Nippon Piston Ring Co., Ltd.: *See*—
Umeha, Genkichi; Fujita, Yoshiaki; and Shimura, Atsushi, 4,612,695, Cl. 29-505.000.
Nippon Steel Corporation: *See*—
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Ohya, Yoshihiro, 4,613,842, Cl. 336-218.000.
Nippon Zeon Co., Ltd.: *See*—
Sekiya, Masayoshi; and Harada, Koichi, 4,613,633, Cl. 523-201.000.
Sekiya, Masayoshi; Ishizuka, Toshiro; Maeda, Daiharu; Miyamoto, Kenzo; and Shimazoe, Takahiro, 4,613,650, Cl. 524-828.000.
Nippondenso Co., Ltd.: *See*—
Ando, Hirohumi; and Kondo, Takashi, 4,612,771, Cl. 60-611.000.
Hibi, Yasuo; Shibata, Tadahiko; and Iwase, Takatoshi, 4,613,034, Cl. 198-465.100.
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, 4,612,894, Cl. 123-494.000.
Suzuki, Hirofumi; Yoshida, Hitoshi; and Yamaguchi, Shunzo, 4,613,455, Cl. 252-516.000.
Nishijima, Akio, to Alps Electric Co., Ltd. Low profile pushbutton switch with tactile feedback. 4,613,737, Cl. 200-340.000.
Nishijima, Hideo: *See*—
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Tilt steering equipment. 4,612,822, Cl. 74-493.000.
Nishimoto, Yuji: *See*—
Suzuki, Yoshiki; Sekine, Kunio; Nagai, Tsuneji; Nambu, Naoki; and Nishimoto, Yuji, 4,613,500, Cl. 429-85.000.
Nishimura, Sadanori, to Honda Giken Kogyo Kabushiki Kaisha. Torque converter one way lock-up clutch. 4,613,022, Cl. 192-3.290.
Nishimura, Yasuyuki: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.
Nishimura, Yoichi: *See*—
Higashi, Hidehiro; Shirono, Katsuhiro; Arima, Yuusaku; Nishimura, Yoichi; and Yoshida, Shinichi, 4,613,425, Cl. 208-89.000.
Nishimura, Yutaka: *See*—
Kuroiwa, Hiroshi; Nishimura, Yutaka; and Oyama, Yoshishige, 4,612,895, Cl. 123-494.000.
Nishizawa, Jun-ichi. Vertical semiconductor photoelectric transducer with improved separated gate structure. 4,613,881, Cl. 357-22.000.
Nissan Motor Co., Ltd.: *See*—
Hayashi, Toshihiko; and Matsuzaki, Yoshitomi, 4,612,977, Cl. 165-71.000.
Hiraiwa, Kazuyoshi; and Muraoka, Akihiko, 4,613,008, Cl. 180-247.000.
Morihiro, Shinji, 4,613,317, Cl. 464-131.000.
Sato, Yoshimi, 4,612,729, Cl. 49-362.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,613,153, Cl. 280-689.000.
Urabe, Suehiro; and Iwasa, Yoshio, 4,612,903, Cl. 123-432.000.
Nitta, Issei: *See*—
Fukami, Harukazu; Inoue, Shinya; Nitta, Issei; Nakao, Kenichiro; and Kikumoto, Ryoji, 4,613,598, Cl. 514-211.000.
Nitta, Tsuneharu: *See*—
Kuwata, Jun; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,613,546, Cl. 428-336.000.
Niwa, Shigeo: *See*—
Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, 4,613,577, Cl. 501-35.000.
NL Industries, Inc.: *See*—
Rao, M. Vikram; Kalsi, Manmohan S.; and Alvarez, Patricio D., 4,613,443, Cl. 252-21.000.
Nobel, Reinhard: *See*—
Forster, Ludwig; Franke, Alois; and Nobel, Reinhard, 4,613,375, Cl. 106-281.00R.
Nobis, Rudolph H.: *See*—
Brinkerhoff, Ronald J.; and Nobis, Rudolph H., 4,612,933, Cl. 128-334.00R.
Nodera, Hisatoshi: *See*—
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; Imazu, Keinosuke; and Tomioka, Hidehiro, 4,613,830, Cl. 331-65.000.
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic set-up system. 4,612,946, Cl. 134-62.000.
Noma, Kouichi; Matsuda, Kazuto; and Sakurai, Toshio, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Humidifier unit for refrigerated display cabinets. 4,612,777, Cl. 62-247.000.
Nomura, Takeshi: *See*—
Maruyama, Kouji; Nomura, Takeshi; Ueno, Hiroshi; and Inaba, Naomi, 4,613,581, Cl. 502-127.000.
Nonaka, Chiaki: *See*—
Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, 4,613,967, Cl. 369-221.000.
Nopper, Richard W., Jr.: *See*—
Sternberg, Ben K.; and Nopper, Richard W., Jr., 4,613,821, Cl. 324-323.000.
Nordischer Machinenbau Rud. Baader GmbH & Co. KG: *See*—
Wenzel, Werner, 4,613,031, Cl. 198-399.000.

Nordson Corporation: *See*—
Kolibas, James A., 4,613,813, Cl. 324-72.000.
Marshall, Robert C., 4,613,078, Cl. 239-390.000.
Merkel, Stephen L., 4,613,059, Cl. 222-52.000.
Mueller, William P., 4,613,528, Cl. 427-421.000.
Mulder, Douglas C.; and O'Ryan, David E., 4,613,083, Cl. 239-707.000.

Nordyke, David M.: *See*—
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., 4,613,345, Cl. 51-293.000.

Norikazu, Arai, to Konishiroku Photo Industry Co., Ltd. Objective lens for optical disk. 4,613,212, Cl. 350-432.000.

North American Philips Corporation: *See*—
Nadan, Joseph S., 4,613,903, Cl. 358-141.000.

North American Systems, Inc.: *See*—
Marotta, Vincent G.; and Komatsu, Ikuo I., 4,613,745, Cl. 219-297.000.

Northeastern University: *See*—
Whang, Sung-Hyun, 4,612,973, Cl. 164-508.000.

Northern Telecom Limited: *See*—
Cwirzen, Casimir; and Jaycox, Donald F., 4,613,732, Cl. 179-178.000.

Norton, Jane A.; Twyman, Diana L.; Young, A. Byron; and Rapp, Robert, to University of Kentucky Research Foundation. Multiple function intubation apparatus and method. 4,613,323, Cl. 604-43.000.

Noto, Richard: *See*—
Smith, David C.; and Noto, Richard, 4,613,941, Cl. 364-490.000.

Novak, Leo R.: *See*—
Kitchens, John D.; and Novak, Leo R., 4,613,653, Cl. 525-352.000.

Novatome: *See*—
Soucille, Michel; Castelnau, Laurent; and Traiteur, Rene M., 4,612,976, Cl. 165-70.000.

Nowack, Gerhard P.: *See*—
Kukes, Simon G.; Nowack, Gerhard P.; and Banks, Robert L., 4,613,719, Cl. 585-528.000.

NPC Systems, Inc.: *See*—
Gundy, William P., 4,612,730, Cl. 51-3.000.

Nukumi, Masumi: *See*—
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.

N.V. Nederlandsche Apparatenfabriek NEDAP: *See*—
de Jong, Hendrik J., 4,612,719, Cl. 40-21.00R.

Ober, Christopher K.; Lok, Kar P.; Hair, Michael L.; and Branston, Randolph E., to Xerox Corporation. Process for colored toner compositions with controlled charges thereon. 4,613,559, Cl. 430-137.000.

Object Recognition Systems, Inc.: *See*—
Wilder, Joseph; and Ray, Rajarshi, 4,613,269, Cl. 364-513.000.

O'Brien, Stanley B.: *See*—
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., 4,613,345, Cl. 51-293.000.

Occidental Chemical Corporation: *See*—
Markezich, Ronald I., 4,613,651, Cl. 525-42.000.

O'Connell, James P.: *See*—
Williams, Joel L.; Dunn, Terry S.; O'Connell, James P.; and Montgomery, David, 4,613,517, Cl. 427-2.000.

Odawara, Yoji: *See*—
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.

O'Donnell, Bernard N., to United States of America, Air Force. Adaptive mutual interference suppression method. 4,613,862, Cl. 343-17.1PF.

O'Donnell, Matthew: *See*—
Glover, Gary H.; and O'Donnell, Matthew, 4,613,949, Cl. 364-527.000.

Oettgen, Herbert F.: *See*—
Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., 4,613,576, Cl. 436-548.000.

Oftebro, Ivar: *See*—
Einstabland, Tomas B.; Aas, Gunnar; Berg, Nicolay G.; Bonke, Knut; and Oftebro, Ivar, 4,613,252, Cl. 405-76.000.

Ogasawara, Akira, to Nippon Kogaku K. K. Motor driver for autofocus camera. 4,613,224, Cl. 354-402.000.

Ogiso, Toshio: *See*—
Mori, Kenji; and Ogiso, Toshio, 4,613,782, Cl. 310-323.000.

Ogle, James A.: *See*—
Holz, George E.; and Ogle, James A., 4,613,854, Cl. 340-714.000.

Ogura Jewel Industry Co., Ltd.: *See*—
Ichikawa, Yoshiyasu, 4,613,740, Cl. 219-69.00W.

Ogura, Tsuneo, to Kabushiki Kaisha Toshiba. Method for fabricating a thyristor. 4,613,381, Cl. 148-1.500.

Oguri, Masahiro: *See*—
Yanadori, Michio; Kawano, Tomohiro; Miyamoto, Seigo; Nara, Yasuaki; and Oguri, Masahiro, 4,612,974, Cl. 165-10.000.

Oguri, Tomei; Morinaka, Yasuhiro; and Kadowaki, Shuichiro, to Mitsubishi Yuka Pharmaceutical Co., Ltd. γ-butyrolactone derivatives, process for preparing the same and immunomodulating compositions containing the same as active ingredients. 4,613,613, Cl. 514-461.000.

O'Hare, Thomas E.: *See*—
Mahajan, Devinder; Slegeir, William A.; Sapienza, Richard S.; and O'Hare, Thomas E., 4,613,623, Cl. 518-700.000.

Ohashi, Hiromu: *See*—
Suzuka, Masakazu; Ohashi, Hiromu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,613,947, Cl. 364-526.000.

Ohashi, Tsuneo: *See*—
Iwase, Takayuki; and Ohashi, Tsuneo, 4,613,248, Cl. 400-697.100.

Ohmori, Shohi, to Sony Corporation. Method of broadcasting an encoded video signal and a receiving apparatus for decoding the signal. 4,613,902, Cl. 358-124.000.

Ohmura, Jukichi: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,613,467, Cl. 260-543.00F.

Ohnishi, Masanori, to Diesel Kiki Co., Ltd. Centrifugal governor for internal combustion engines. 4,612,890, Cl. 123-373.000.

Ohshima, Michio: *See*—
Okamoto, Toshiro; and Ohshima, Michio, 4,613,426, Cl. 208-107.000.

Ohta, Takahiro, to Fuji Photo Film Co., Ltd. Photographic film with magnetic recording track and method of recording on the track and reproduction from the same. 4,613,911, Cl. 360-3.000.

Ohtani, Yoshinori: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.

Ohtawa, Masanori: *See*—
Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, 4,613,967, Cl. 369-221.000.

Ohtsuka, Shuichi: *See*—
Kimura, Akinori; and Ohtsuka, Shuichi, 4,613,226, Cl. 355-10.000.

Ohya, Yoshihiro: *See*—
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Ohya, Yoshihiro, 4,613,842, Cl. 336-218.000.

Ohzono, Kohei; and Hayashi, Tsutomu, to Honda Giken Kogyo Kabushiki Kaisha. Friction clutch device. 4,613,026, Cl. 192-85.0AA.

Oida, Osamu, to NEC Corporation. Charge transfer plasma display device. 4,613,794, Cl. 315-169.400.

Ojakaar, Leo, to Du Pont de Nemours, E. I., and Company. Peroxide-curable brominated fluoroelastomer composition containing an N,N,N',N'-tetrasubstituted 1,8-diaminonaphthalene. 4,613,636, Cl. 524-83.000.

Okabayashi, Mitumasa; and Shiga, Norio, to Tokyo Juki Industrial Co., Ltd. Device for mounting printing type array on printer. 4,613,244, Cl. 400-175.000.

Okada, Kunihiro; Endo, Hirohide; and Saito, Susumu, to Hitachi, Ltd.; and Hitachi Koki Company, Ltd. Photoelectric converting apparatus for optical scanning system. 4,613,753, Cl. 250-236.000.

Okahashi, Kazuo; Hayashi, Osamu; Ishii, Isao; and Kobayashi, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Insulating pipe joint. 4,613,167, Cl. 285-54.000.

Okai, Yasuji, to Kyowa Hakko Kogyo Co., Ltd. Regulatory substance of DNA synthesis. 4,613,458, Cl. 530-351.000.

Okajima, Satoru: *See*—
Yamanishi, Kazuhiko; Shintani, Akinori; Okajima, Satoru; and Hanada, Toshiro, 4,613,465, Cl. 260-394.000.

Okamoto, Hiroyuki: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.

Okamoto, Hitoshi: *See*—
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.

Okamoto, Kaneyuki: *See*—
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.

Okamoto, Toshiro; and Ohshima, Michio, to Mitsubishi Jukoygo Kabushiki Kaisha. Thermal cracking process for producing petrochemical products from hydrocarbons. 4,613,426, Cl. 208-107.000.

Okamoto, Yoshio: *See*—
Yuki, Heimei; and Okamoto, Yoshio, 4,613,442, Cl. 252-1.000.

Okamura, Kenji: *See*—
Nakamura, Shunichi; Okamura, Kenji; Kaneko, Shingo; and Sumi, Kiyoshi, 4,613,643, Cl. 524-426.000.

Okamura, Minoru: *See*—
Ide, Tohru; and Okamura, Minoru, 4,612,828, Cl. 74-866.000.

Okaniwa, Kenichiro: *See*—
Yasoshima, Seikichi; Koyama, Mikio; and Okaniwa, Kenichiro, 4,613,567, Cl. 435-7.000.

Okazaki, Kunio: *See*—
Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, 4,613,791, Cl. 315-82.000.

Okimoto, Haruo: *See*—
Tadokoro, Tomoo; Matsuda, Ikuo; and Okimoto, Haruo, 4,612,770, Cl. 60-602.000.
Tadokoro, Tomoo; and Okimoto, Haruo, 4,612,904, Cl. 123-492.000.

Okita, Masao, to Alps Electric Co., Ltd. Disk drive mechanism. 4,613,968, Cl. 369-270.000.

Okuda, Hiroshi: *See*—
Honjoh, Yoshihisa; and Okuda, Hiroshi, 4,612,899, Cl. 123-413.000.

Okuma, Michio: *See*—
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.

Okumura, Koji: *See—*
Mort, Joseph; Jansen, Frank; Okumura, Koji; Grammatica, Steven J.; and Morgan, Michael A., 4,613,556, Cl. 430-57.000.

Okura Kogyo Kabushiki Kaisha: *See—*
Saeki, Takashi; and Matsuda, Hideaki, 4,613,649, Cl. 524-650.000.

Olah, George A., to PCUK-Produits Chimiques Ugine Kuhlmann. Process for effecting hydrocarbon isomerization or alkylation. 4,613,723, Cl. 585-730.000.

Old, Lloyd J.: *See—*
Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., 4,613,576, Cl. 436-548.000.

Olin Corporation: *See—*
Dantzig, Jonathan A., 4,612,972, Cl. 164-465.000.

Olin, Daniel C.; Anderson, Russell Y.; and DenBeste, Steven C., to Tektronix, Inc. Character and video mode control circuit. 4,613,856, Cl. 340-723.000.

Oliver, Derald, to Utah Power & Light. Method and apparatus for protecting boiler ignitors. 4,613,302, Cl. 431-263.000.

Olliero, Dominique: *See—*
Choay, Patrick; Roger, Pierre; and Olliero, Dominique, 4,613,618, Cl. 514-538.000.

Olsen, Peter C., Jr.: *See—*
Taylor, Bobby C.; and Olsen, Peter C., Jr., 4,612,753, Cl. 53-398.000.

Olson, Jay H., to Deere & Company. Seed meter having cleanout and seed sealing member. 4,613,056, Cl. 221-211.000.

Olsson, Burton K., to Chicago Rawhide Manufacturing Co. Unitized seal for severe service applications. 4,613,005, Cl. 175-371.000.

Olympus Optical Co., Ltd.: *See—*
Imai, Yuji, 4,613,748, Cl. 250-201.000.

Omitsu, Takashi, to Aisin Seiki Kabushiki Kaisha. Accelerator control for a vehicular propulsion system having a continuously variable ratio transmission. 4,612,827, Cl. 74-866.000.

Omori, Toshiaki, to Tokyo Gas Company, Ltd. Steam heating equipment with condensate vessel and return line. 4,613,071, Cl. 237-9.00R.

Omron Tateisi Electronics, Co.: *See—*
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; Imazu, Keinosuke; and Tomioka, Hidehiro, 4,613,830, Cl. 331-65.000.

Omura, Satoshi; Tanaka, Haruo; Hinotozawa, Kiyoizumi; Murata, Masatsune; and Iwai, Yuzuru, to Satoshi Omura. Antibiotic having herbicidal activity. 4,613,355, Cl. 71-86.000.

Onizuka Yasuki: *See—*
Ikeda, Yoshiaki; Tamura, Yoshio; Nanri, Masahiko; and Onizuka, Yasuki, 4,613,245, Cl. 400-313.000.

Ono, Hideki: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.

Ono, Mikiya: *See—*
Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, 4,613,577, Cl. 501-35.000.

Ono, Taizo: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.

Onodera, Kaoru: *See—*
Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, 4,613,564, Cl. 430-549.000.
Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, 4,613,565, Cl. 430-549.000.

Onodera, Masakichi. Steamer of steam circulation system. 4,612,911, Cl. 126-369.000.

Optical Technologies, Inc.: *See—*
Davis, Charles M., 4,613,752, Cl. 250-227.000.

Orion Industries, Inc.: *See—*
Ayton, Ian F., 4,613,215, Cl. 350-604.000.

Orisaku, Masami: *See—*
Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, 4,613,490, Cl. 423-344.000.

Ortlepp, Hilmar S.: *See—*
Benedek, Vasile; Huckler, Volker; and Ortlepp, Hilmar S., 4,612,995, Cl. 172-7.000.

O'Ryan, David E.: *See—*
Mulder, Douglas C.; and O'Ryan, David E., 4,613,083, Cl. 239-707.000.

Osaka Titanium Co., Ltd.: *See—*
Morimoto, Shiro, 4,613,489, Cl. 423-342.000.

Osmano, Beltrami: *See—*
Bulgarelli, Vittorio, 4,612,716, Cl. 37-103.000.

Osterloh, Rolf: *See—*
Blum, Rainer; and Osterloh, Rolf, 4,613,639, Cl. 524-251.000.

Oswald, James C.: *See—*
Le, Hue P.; Jaeger, Charles W.; and Oswald, James C., 4,613,875, Cl. 346-140.00R.

Otomo, Ryuzi: *See—*
Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, 4,613,221, Cl. 354-321.000.
Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, 4,613,222, Cl. 354-321.000.

Otsap, Ben A.: *See—*
Tiep, Brian L.; Phillips, Robert E.; and Otsap, Ben A., 4,612,928, Cl. 128-204.230.

Ott, Russell G., to RCA Corporation. Switchable oscillator circuit. 4,613,829, Cl. 331-59.000.

Ott, William E.: *See—*
Deem, Brian C.; and Ott, William E., 4,613,020, Cl. 180-196.00M.

Owen, David J., to Imperial Chemical Industries PLC. Electrostatic spraying. 4,613,075, Cl. 239-3.000.

Owens-Illinois, Inc.: *See—*
Fumei, Giancarlo J., 4,612,721, Cl. 40-310.000.
Gregory, James L.; and Wolfe, Steven R., 4,613,052, Cl. 215-252.000.

Oy Safematic Ltd.: *See—*
Heilala, Antti-Jussi, 4,613,142, Cl. 277-81.00R.

Oy Tampella AB: *See—*
Maatta, Raimo, 4,613,434, Cl. 210-151.000.

Oyachi, Tomio; Takahashi, Minoru; Izuhara, Koichi; Akiyama, Setsuo; and Yoshikawa, Masato, to Bridgestone Corp. Method for treating golf ball surface with glow discharge plasma and apparatus therefor. 4,613,403, Cl. 156-643.000.

Oyama, Akira: *See—*
Mohri, Akira; and Oyama, Akira, 4,613,925, Cl. 361-420.000.

Oyama, Yoshishige: *See—*
Kuroiwa, Hiroshi; Nishimura, Yutaka; and Oyama, Yoshishige, 4,612,895, Cl. 123-494.000.

P. V. Tool, Inc.: *See—*
Vindez, Pierre G., 4,612,998, Cl. 173-19.000.

Paar, Adalbert: *See—*
Prunbauer, Kurt; and Paar, Adalbert, 4,612,787, Cl. 70-358.000.

Pacholok, David R. Power supply for gas discharge devices. 4,613,934, Cl. 363-131.000.

Packer, Louis L.; Bosshart, George S.; Jaworowski, Mark R.; and Kuntz, Urban E., to United Technologies Corporation. Apparatus for controlling powder flow rate in a carrier gas. 4,613,259, Cl. 406-14.000.

Pagani, Giorgio, to Montedison S.p.A. Process for the displacement to the gaseous phase of the excess of NH_3 contained in an aqueous urea solution. 4,613,697, Cl. 564-67.000.

Paine, John C., to Caterpillar Industrial Inc. Programmable service reminder apparatus and method. 4,613,939, Cl. 364-424.000.

Palfery, Kenneth J.; Maharaj, Kenrick B.; Malcom, John S.; Puckering, Donald R.; and Wong, Kee-Shong, to McDonnell Douglas Corporation. Automated machining system having a workpiece transfer apparatus. 4,612,697, Cl. 29-568.000.

Pall Corporation: *See—*
Christel, Conrad, Jr., 4,613,815, Cl. 324-233.000.
Koehler, Paul C., 4,613,369, Cl. 75-246.000.

Palley, Igor: *See—*
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,613,535, Cl. 428-113.000.

Pallez, Francois: *See—*
Lamerant, Jean-Michel; Pallez, Francois; and Personnet, Pierre-Bernard, 4,613,361, Cl. 75-2.000.

Pallos, Ferenc M., to Stauffer Chemical Company. Aryloxyphenoxy propionylthioureas which are useful as herbicides. 4,613,356, Cl. 71-94.000.

Palz, Helmut; and Kainer, Hartmut, to Didier-Werke AG. Ceramic recuperator tube and a recuperator employing plural such tubes. 4,612,981, Cl. 165-158.000.

Panek, Peter: *See—*
Weiler, Rolf; Thiel, Rudolf; Bach, Uwe; and Panek, Peter, 4,613,018, Cl. 188-72.400.

Panicker, Ramachandra M. P.; and Essinger, Walter F., to Sigmatron Nova, Inc. Light emission enhancing dielectric layer for EL panel. 4,613,793, Cl. 315-169.300.

Pann, Keh: *See—*
Hinkley, David; and Pann, Keh, 4,613,960, Cl. 367-51.000.

Pannell, Richard B.: *See—*
Beuther, Harold; Kibby, Charles L.; Kobylinski, Theddeus P.; and Pannell, Richard B., 4,613,624, Cl. 518-715.000.

Pant, Aniket: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Mitchell, David N.; and Pant, Aniket, 4,613,418, Cl. 204-243.00R.

Pao, Peter Y. M.: *See—*
Briley, George C.; and Pao, Peter Y. M., 4,612,780, Cl. 62-381.000.

Papa, Ralph A., to Du Pont de Nemours, E. I., and Company. Grounding connector. 4,613,191, Cl. 339-14.00R.

Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of 5-hydroxyethylsulfonyl-2-aminophenol (ethers). 4,613,704, Cl. 564-418.000.

Papenfuhs, Theodor: *See—*
Arndt, Otto; and Papenfuhs, Theodor, 4,613,698, Cl. 564-412.000.

Papiernik, Wolfgang: *See—*
Baisch, Roderich; Gose, Horst; and Papiernik, Wolfgang, 4,612,709, Cl. 33-125.00R.

Papir, Yoram S.; and Schroeder, Albert H., to Chevron Research Company. Electrochromic devices. 4,613,211, Cl. 350-357.000.

Papst-Motoren GmbH & Co. KG: *See—*
Wrobel, Gunter; and Koletzki, Ulrich, 4,613,778, Cl. 310-90.000.

Paquet, Jean-Marc; and Sibuet, Rene , to Cit-Alcatel Compagnie Industrielle des Telecommunications. Valve which is opened by reduced pressure. 4,613,111, Cl. 251-46.000.

Parise, John B.: *See—*
Bonifaz, Cristobal; Corbin, David R.; and Parise, John B., 4,613,720, Cl. 585-640.000.

Park, David B.; Weaver, John A.; and Zumbrum, A. Scott, to Stewart Systems, Inc. Rod-type conveyor belt. 4,613,037, Cl. 198-778.000.

Parker-Hannifin Corporation: *See*—
Mains, Robert T., 4,613,079, Cl. 239-462.000.
Parker, Harry L., to Pitney Bowes Inc. Method and apparatus for creating fonts for an electronic character generator. 4,613,945, Cl. 364-518.000.
Parry, Robert W.; Baumann, John A.; and Schachter, Rozalie, to Stauffer Chemical Company. Pnictide trap for vacuum systems. 4,613,485, Cl. 422-173.000.
Pasquale, Antonio: *See*—
Marraccini, Antonio; Carlini, Filippo M.; Bottaccio, Giorgio; Pasquale, Antonio; and Maranzana, Giorgio, 4,613,667, Cl. 546-14.000.
Paszthy, Gyorgy: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.
Patalong, Hubert, to Siemens Aktiengesellschaft. Thyristor having controllable emitter short circuits. 4,613,766, Cl. 307-252.00A.
Paterson, James L.; and Haken, Roger A., to Texas Instruments Incorporated. Floating gate memory with improved dielectric. 4,613,956, Cl. 365-185.000.
Paton, H. Neil. Suspension strut. 4,613,114, Cl. 267-9.00R.
Paukovita, Edward J., Jr.: *See*—
Loomis, Phillip E.; Paukovits, Edward J., Jr.; Schuppert, Leo V., Jr.; and Spong, Richard V., 4,612,700, Cl. 29-564.600.
Paul, James M.: *See*—
Espenscheid, Wilton F., deceased; and Paul, James M., 4,613,631, Cl. 523-130.000.
Paul, Marsha A.: *See*—
Langer, Horst G.; Brady, Thomas P.; Paul, Marsha A.; and Doorakian, George A., 4,613,661, Cl. 528-108.000.
Pazmandi, Gyula: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.
PCUK-Produits Chimiques Ugine Kuhlmann: *See*—
Olah, George A., 4,613,723, Cl. 585-730.000.
Pecak, Tadeusz: *See*—
Wishart, Scott A.; Pecak, Tadeusz; Wilson, Owen H.; and Boon, Anthony J., 4,613,127, Cl. 271-274.000.
Pedain, Josef: *See*—
Konig, Klaus; Pedain, Josef; and Woynar, Helmut, 4,613,686, Cl. 560-335.000.
Potter, Terry; Thoma, Wilhelm; and Pedain, Josef, 4,613,527, Cl. 427-412.000.
Pedersen, S. Erik; Shaw, Wilfrid G.; and Pfingsten, Linda L., to Standard Oil Company, The. Indenes by catalytic dehydrocyclization. 4,613,711, Cl. 585-411.000.
Pellegrino, Arthur J.: *See*—
Sacchetti, John A.; Tordella, Joseph R.; and Pellegrino, Arthur J., 4,613,057, Cl. 221-265.000.
Pelloux-Gervais, Pierre; and Neret, Jean-Louis, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cryogenic liquid distributing device. 4,612,773, Cl. 62-50.000.
Pendell, Gail J., general personal representative: *See*—
Jacobsen, Stephen C.; Wright, Harlan R., deceased; and Pendell, Gail J., general personal representative, 4,613,331, Cl. 623-61.000.
Penney, Bruce J., to Tektronix, Inc. Method of measuring a frequency domain characteristic. 4,613,814, Cl. 324-77.00B.
Pennzoil Company: *See*—
Magyar, Arpad M., 4,613,446, Cl. 252-91.000.
Pente Games, Inc.: *See*—
Morris, Robert L., II; and Nichols, Franklin C., 4,613,040, Cl. 206-315.100.
Perotti, Andre , to Edouard Dubied & Cie. S.A. Latch-type needle for transferring stitches. 4,612,786, Cl. 66-121.000.
Person, Herman R.; Hesse, Joseph F.; and Raysby, Keith T., to Dale Electronics, Inc. Direct current dot matrix plasma display having integrated drivers. 4,613,855, Cl. 340-718.000.
Personal Products Company: *See*—
Dabi, Shmuel, 4,613,543, Cl. 428-304.400.
Personnet, Pierre-Bernard: *See*—
Lamerant, Jean-Michel; Pallez, Francois; and Personnet, Pierre-Bernard, 4,613,361, Cl. 75-2.000.
Pescatore, Richard; and Boumendil, Jean-Jack, to Piezo-Ceram Electronique. Machine for heating an article or product by vapor condensation. 4,612,712, Cl. 34-68.000.
Peterson, Donald E., to Tappan Company, The. Power cord strain relief. 4,613,192, Cl. 339-14.00P.
Peterson, Rex W. Carburetor for internal combustion engines. 4,613,469, Cl. 261-41.00B.
Petrzilka, Martin: *See*—
Boller, Arthur; Germann, Alfred; Petrzilka, Martin; and Schadt, Martin, 4,613,208, Cl. 350-349.000.
Pfaff Industriemaschinen GmbH: *See*—
Roach, Joachim; Geisselmann, Heribert; and Wagner, Richard, 4,612,867, Cl. 112-314.000.
Pfeiffer, Gottfried, to A/S N. Foss Electric. Method for release and separation of parasites or parasite eggs from meat. 4,613,568, Cl. 435-23.000.
Pfingsten, Linda L.: *See*—
Pedersen, S. Erik; Shaw, Wilfrid G.; and Pfingsten, Linda L., 4,613,711, Cl. 585-411.000.
Pfizer Hospital Products Group, Inc.: *See*—
Kucheria, Chhattar S.; and Wells, Rodney E., 4,613,516, Cl. 427-2.000.
Pfizer, Inc.: *See*—
Barth, Wayne E., 4,613,462, Cl. 540-310.000.
Phares and Wilkins Mfg. Co.: *See*—
Wilkins, Walter B., 4,612,997, Cl. 172-776.000.
Pharmuka Laboratoires: *See*—
Gueremy, Claude G. A.; Mestre, Michel A. P.; and Renault, Christian L. A., 4,613,607, Cl. 514-314.000.
Phillips, Alan C., to Etak, Inc. Data encoding and decoding scheme. 4,613,913, Cl. 360-51.000.
Phillips Petroleum: *See*—
Porter, Randall A.; and Reed, Larry E., 4,613,372, Cl. 106-1.130.
Phillips Petroleum Company: *See*—
Ayres, C. A.; Scott, John N., Jr.; and Sherk, Fred T., 4,613,484, Cl. 422-132.000.
Haskell, Donald M., 4,613,715, Cl. 585-412.000.
Kolts, John H.; and Delzer, Gary A., 4,613,722, Cl. 585-651.000.
Kukes, Simon G.; Nowack, Gerhard P.; and Banks, Robert L., 4,613,719, Cl. 585-528.000.
Murray, Lawrence K., 4,612,711, Cl. 34-39.000.
Shaw, James E., 4,612,991, Cl. 166-273.000.
Phillips, Robert E.: *See*—
Tiep, Brian L.; Phillips, Robert E.; and Otsap, Ben A., 4,612,928, Cl. 128-204.230.
Phlipot, James R.; and Scharfenberg, Randolph E., to Essex Industries, Inc. Quick-disconnect fitting for gas line connection. 4,613,112, Cl. 251-149.600.
Piaggio & C. S.p.A.: *See*—
Doveri, Carlo, 4,612,891, Cl. 123-373.000.
Picker International Ltd.: *See*—
Chui, Kui M., 4,613,819, Cl. 324-308.000.
Pierce, Richard H.: *See*—
Cheney, Richard F.; and Pierce, Richard H., 4,613,371, Cl. 75-255.000.
Pierre, Alain: *See*—
Massard, Christian; Pierre, Alain; and Roumegoux, Jean-Louis, 4,612,736, Cl. 51-284.00E.
Piezo-Ceram Electronique: *See*—
Pescatore, Richard; and Boumendil, Jean-Jack, 4,612,712, Cl. 34-68.000.
Pilie, Roland J.: *See*—
Akers, Charles K.; and Pilie, Roland J., 4,612,916, Cl. 128-1.00R.
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, to General Electric Company. Hybrid extended drain concept for reduced hot electron effect. 4,613,882, Cl. 357-23.300.
Pinnow, Kenneth E.: *See*—
Eckenrod, John J.; Pinnow, Kenneth E.; Rhodes, Geoffrey O.; and Royer, William E., 4,613,367, Cl. 420-42.000.
Pioneer Electronic Corporation: *See*—
Hirano, Hiroyuki, 4,613,963, Cl. 369-44.000.
Ishii, Satoshi, 4,613,776, Cl. 307-490.000.
Kuriyama, Kazumi, 4,613,202, Cl. 350-6.400.
Pitney Bowes Inc.: *See*—
Parker, Harry L., 4,613,945, Cl. 364-518.000.
Pitowski, Hans-Jurgen: *See*—
Gerlach, Klaus; Mathes, Nikolaus; Pitowski, Hans-Jurgen; and Wechs, Friedbert, 4,612,688, Cl. 28-104.000.
Pitroda, Satyan G.: *See*—
Fechalos, William A.; and Pitroda, Satyan G., 4,613,730, Cl. 179-81.00R.
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with Mercapto-C_2-C_3-alkanoic esters. 4,613,510, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with dialkylthioalkenes, dialkylthioalkylcycloalkenes and monoalkylthioalkenylcycloalkenes. 4,613,511, Cl. 426-535.000.
Pittinger, Charles B., Sr.; and Pittinger, Cynthia A. Rotary flail cutting and finishing tool head. 4,612,738, Cl. 51-335.000.
Pittinger, Cynthia A.: *See*—
Pittinger, Charles B., Sr.; and Pittinger, Cynthia A., 4,612,738, Cl. 51-335.000.
Pittman, Paul R.; Scott, Floyd L., Jr.; and Hamilton, William R., to Hughes Tool Company. Downhole drilling tool with improved swivel. 4,613,002, Cl. 175-107.000.
Pizzolato, Giacomo: *See*—
Baggiolini, Enrico; Pizzolato, Giacomo; Uskokovic, Milan; and Truitt, Gary, 4,613,594, Cl. 514-167.000.
Plant Research Laboratories: *See*—
Driver, John A., 4,612,725, Cl. 47-58.000.
Plath, Ernst-Dieter, to Sipra Patententiwcklungs-und Beteiligungs-Gesellschaft. Circular knitting machine and method of producing jacquard-patterned plush webs. 4,612,784, Cl. 66-9.00R.
Plochberger, Franz: *See*—
Eisenkolb, Klaus; Plochberger, Franz; and Puhringer, Johann, 4,613,035, Cl. 198-509.000.
Pohl, Claus: *See*—
Neuhold, Arnold; and Pohl, Claus, 4,612,754, Cl. 53-457.000.
Pohl, Karl-Heinz, to Siemon Company, The. Multiple electrical connector and staggered mounting block. 4,613,194, Cl. 339-19.000.

Poignant, Jean-Claude: *See*—
Regnier, Gilbert; and Poignant, Jean-Claude, 4,613,601, Cl. 514-252.000.

Polar Molecular Corp.: *See*—
Nelson, Otis L., Jr.; and Nelson, Mark L., 4,613,340, Cl. 44-53.000.

Pollack, Frank, to Advanced Air Systems. Method and apparatus for moving air across a mineral face. 4,612,848, Cl. 98-50.000.

Pollard, Jean. Device relating to electro-optical image display. 4,613,210, Cl. 350-356.000.

Polygram GmbH: *See*—
Drechsler, Klaus D.; Heuer, Werner; and Tiebel, Rainer, 4,613,751, Cl. 250-223.00R.

Pommer, Karl E., II, to GTE Communication Systems Corp. Temperature dependent, voltage reference comparator/diode. 4,613,768, Cl. 307-350.000.

Pope, Ralph D. Quick-release device. 4,613,180, Cl. 294-82.340.

Poppe, Horst, to Blohm & Voss AG. Anchor system. 4,612,869, Cl. 114-293.000.

Porter, Randall A.; and Reed, Larry E., to Phillips Petroleum. Antifoulants for thermal cracking processes. 4,613,372, Cl. 106-1.130.

Potter, Huntington, to President and Fellows of Harvard College. Hybridization assay and kit therefor. 4,613,566, Cl. 435-6.000.

Potter, Terry; Thoma, Wilhelm; and Pedain, Josef, to Bayer Aktiengesellschaft. PUR-coating compositions which are cross-linkable under heat, a process for their production and their use thereof as an adhesive coat for textiles. 4,613,527, Cl. 427-412.000.

PPG Industries, Inc.: *See*—
Chang, Wen-Hsuan; and McKeough, David T., 4,613,451, Cl. 252-182.000.
Tang, Robert H., 4,613,656, Cl. 526-193.000.

PQ Corporation: *See*—
Hertzenberg, Elliot P., 4,613,578, Cl. 502-64.000.

Prandle, David L.: *See*—
Smith, Ian P.; Prandle, David L.; Barker, Reginald C.; and Litherland, Robert M. J., 4,613,168, Cl. 285-150.000.

President and Fellows of Harvard College: *See*—
Potter, Huntington, 4,613,566, Cl. 435-6.000.

Preston Engravers, Inc.: *See*—
Kesten, Martin; Carlson, Leroy H., Jr.; and Kwader, Gary L., 4,613,321, Cl. 493-342.000.

Preventive Diagnostics Corporation: *See*—
Bergman, Hyman C.; Godfrey, James F.; and Gordon, Virginia C., 4,613,574, Cl. 436-2.000.

Prevorsek, Dusan C.: *See*—
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,613,535, Cl. 428-113.000.

Prewo, Karl M.: *See*—
Layden, George K.; and Prewo, Karl M., 4,613,473, Cl. 264-103.000.

Price, Floyd W.; and Vest, Richard, to Burry-Lu, Inc. Wafer agitator assembly for ice cream sandwich machine. 4,612,852, Cl. 99-450.400.

Priest, Joseph R.: *See*—
Smith, Roger, Jr.; Priest, Joseph R.; Langowski, Faustyn C.; and Hebard, Harry D., 4,613,849, Cl. 340-679.000.

Printal OY: *See*—
Makilaakso, Antero, 4,613,536, Cl. 428-124.000.

Procedyne Corp.: *See*—
Staffin, H. Kenneth; and Roaper, R. B., 4,613,713, Cl. 585-241.000.

Produits Chemiques Ugine Kuhlmann: *See*—
Riess, Jean; Jeanneaux, Francois; Le Blanc, Maurice; and Lantz, Andre , 4,613,708, Cl. 570-136.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Foulletier, Louis; and Lantz, Andre , 4,613,681, Cl. 560-236.000.

Proetel, Klaus; Krabbe, Alfred; Haussecker, Klaus; Lemke, Dietrich; Bellemann, Heinrich; and Flock, Franz, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften. Secondary mirror tilting device for a reflecting telescope. 4,613,203, Cl. 350-6.600.

Prunbauer, Kurt; and Paar, Adalbert, to EVVA-Werk Spezialerzeugung Von Zylinder- und Sicherheitsschlossern m.b.H. & Co., Kommanditgesellschaft. Arrangement for cylinder locks. 4,612,787, Cl. 70-358.000.

Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, to Zaklady Urzadzen Chemicznych Metalchem. Method of drawing ribs on tubes. 4,612,790, Cl. 72-96.000.

Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, to Zaklady Urzadzen Chemicznych Metalchem. Method and apparatus for rolling transversely ribbed bimetallic pipes. 4,612,791, Cl. 72-98.000.

Puckering, Donald R.: *See*—
Palfery, Kenneth J.; Maharaj, Kenrick B.; Malcom, John S.; Puckering, Donald R.; and Wong, Kee-Shong, 4,612,697, Cl. 29-568.000.

Pugh, Billy G., to Billy Pugh Co., Inc. Helicopter protector. 4,613,096, Cl. 244-1.00R.

Puhringer, Johann: *See*—
Eisenkolb, Klaus; Plochberger, Franz; and Puhringer, Johann, 4,613,035, Cl. 198-509.000.

Purcell, Thomas L.: *See*—
Green, Dennis A.; and Purcell, Thomas L., 4,612,815, Cl. 73-864.110.

Purvis, Howard A. Edge wear tab for a high temperature valve component. 4,612,955, Cl. 137-375.000.

Purvis, Michael J., to Control Devices, Incorporated. Spring-loaded valve. 4,612,962, Cl. 137-543.170.

Pylon Company, Inc.: *See*—
Cooney, James S., 4,612,703, Cl. 29-885.000.

QMI Corporation: *See*—
Keable, John B., 4,612,875, Cl. 118-670.000.

Quality Pool Supply Co.: *See*—
Engelhart, Jack, 4,613,169, Cl. 285-161.000.

Quang, Pham K.; and Kings, Donald H. M., to Rhone-Poulenc Systemes. Process for developing a latent image formed on a magnetic surface, device for carrying out the process and printing apparatus containing the said device. 4,613,554, Cl. 430-39.000.

Quester, Horst: *See*—
Ulbrich, Hans-Joachim; and Quester, Horst, 4,613,060, Cl. 222-61.000.

Quinnen, Michael. Knitted fabric produced from indigo-dyed yarn. 4,613,336, Cl. 8-494.000.

R. J. Reynolds Tobacco Company: *See*—
Deal, Philip A., 4,612,752, Cl. 53-377.000.

Raab, Herman P., to Consolidated Investments and Development Corp. Voltage monitoring circuit. 4,613,770, Cl. 307-350.000.

Raba, John B.; and Graham, Art. Pool side hoop game backboard. 4,613,136, Cl. 273-1.50R.

Racine, Bill A.; Hixson, Marvin D.; and Huber, Gene A., to Sweco, Incorporated. Pulp screen. 4,613,432, Cl. 209-254.000.

Rafi-Zadeh, Hassan. Cover assembly for pickup truck bed. 4,613,181, Cl. 296-100.000.

Ragland, Frank R., Jr., to RCA Corporation. Color picture tube having an improved simplified support structure for a color selection electrode. 4,613,785, Cl. 313-405.000.

Rain Bird Sprinkler Mfg. Corp.: *See*—
Benson, Briant E.; and Brown, Richard D., 4,613,080, Cl. 239-542.000.

Rakach, Alec; and Bombardieri, Caurino C., to Exxon Production Research Co. Combined replacement drive process for oil recovery. 4,612,989, Cl. 166-263.000.

Ralph Blatchford & Co. Ltd.: *See*—
Blatchford, Michael I., 4,613,276, Cl. 414-542.000.

Ramisch Kleinewefers: *See*—
Mitter, Mathias, 4,612,874, Cl. 118-410.000.

Ramot University Authority for Applied Research and Industrial Development Ltd.: *See*—
Kessler, Efrat; Spierer, Abraham; and Blumberg, Shmaryahum, 4,613,587, Cl. 514-19.000.

Ranchet, Jean. P.; and Serval, Eric, to Compagnie Francaise des Petroles. Water deaeration process. 4,613,347, Cl. 55-53.000.

Randlett, M. Ronald: *See*—
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,612,971, Cl. 164-454.000.

Ranke, Horst: *See*—
Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, 4,613,306, Cl. 432-264.000.

Rao, M. Vikram; Kalsi, Manmohan S.; and Alvarez, Patricio D., to NL Industries, Inc. Nonconducting thread lubricant. 4,613,443, Cl. 252-21.000.

Rapp, Robert: *See*—
Norton, Jane A.; Twyman, Diana L.; Young, A. Byron; and Rapp, Robert, 4,613,323, Cl. 604-43.000.

Rasetti, Vittorio: *See*—
Fuhrer, Walter; Buhlmayer, Peter; Rasetti, Vittorio; and Riniker, Bernhard, 4,613,676, Cl. 560-39.000.

Ray, David J. M., to BP Chemicals Limited. Process for the co-production of a C_2 to C_{10} monocarboxylic acid and formic acid. 4,613,693, Cl. 562-517.000.

Ray, Rajarshi: *See*—
Wilder, Joseph; and Ray, Rajarshi, 4,613,269, Cl. 364-513.000.

Raysby, Keith T.: *See*—
Person, Herman R.; Hesse, Joseph F.; and Raysby, Keith T., 4,613,855, Cl. 340-718.000.

Razgaitis, Richard: *See*—
Boiarski, Anthony A.; Fleck, Barbara H.; Meierhoefer, Eugene J.; and Razgaitis, Richard, 4,612,926, Cl. 128-200.210.

RCA Corporation: *See*—
Kent, Edward J.; Lore, Dorris F.; and Viereck, Eugene J., Jr., 4,613,844, Cl. 338-314.000.
Mawhinney, Daniel D.; and Milgazo, Henry F., 4,613,832, Cl. 331-96.000.
Ott, Russell G., 4,613,829, Cl. 331-59.000.
Ragland, Frank R., Jr., 4,613,785, Cl. 313-405.000.

Reade, Ronald P.: *See*—
Tam, Simon W.; Reade, Ronald P.; Wong, Jerry Y. K.; and Wang, David N., 4,613,400, Cl. 156-643.000.

Readman, John: *See*—
Sutrina, Thomas; and Readman, John, 4,613,892, Cl. 357-75.000.

Rebafka, Walter; and Nickels, Helmut, to BASF Aktiengesellschaft. Preparation of alkyl gallates. 4,613,683, Cl. 560-67.000.

Rechsteiner, Alfred, to Doltron AG. Apparatus for an ultrasonic measuring of a flow quantity and a method of ultrasonically measuring a flow quantity. 4,612,813, Cl. 73-861.250.

Redington, Rowland W.: *See*—
Edelstein, William A.; Eisner, David R.; Redington, Rowland W.; and Smith, Lowell S., 4,613,820, Cl. 324-318.000.

Reed, Larry E.: *See*—
Porter, Randall A.; and Reed, Larry E., 4,613,372, Cl. 106-1.130.

Reed, Ronald D. Wild animal trap. 4,612,723, Cl. 43-61.000.

Refrigeration Engineering Corporation: *See*—
Briley, George C.; and Pao, Peter Y. M., 4,612,780, Cl. 62-381.000.

Refurbished Turbine Components Limited: *See*—
Fraser, Michael J., 4,613,744, Cl. 219-200.000.
Reggio, Carl J., to Apple Adhesives, Inc. Fingerprint development kit and process. 4,613,515, Cl. 427-1.000.
Regnier, Gilbert; and Poignant, Jean-Claude, to Adir, S.A.R.L. (1-benzodioxin-6-ylmethyl)-4-substituted piperazines having antipsychotic activity. 4,613,601, Cl. 514-252.000.
Reid, Donald. Variable high-current electrical load bank with rapid adjustment over a wide range of currents. 4,613,822, Cl. 324-426.000.
Reid, Philip L.; and Holcombe, Edward L. Bottle closure. 4,613,043, Cl. 206-428.000.
Rein, Samuel W.: *See*—
Choi, Frank H.; Rein, Samuel W.; and Alexander, David L., 4,612,799, Cl. 73-54.000.
Relenyi, Attila G.; Wallick, David E.; and Streit, Jill D., to Dow Chemical Company, The. Process for the preparation of Meldrum's acid. 4,613,671, Cl. 549-274.000.
Reliable Security Systems, Inc.: *See*—
Kelly, Michael A., 4,613,176, Cl. 292-201.000.
Renaud, Pierre; and Lassaiz, Philippe, to Valeo. Clutch release bearing suitable for automotive vehicle. 4,613,028, Cl. 192-98.000.
Renault, Christian L. A.: *See*—
Gueremy, Claude G. A.; Mestre, Michel A. P.; and Renault, Christian L. A., 4,613,607, Cl. 514-314.000.
Reneau, Bobby J., to Gripper, Inc. Remotely operable pipe length connector and compensator. 4,613,160, Cl. 285-18.000.
Renuad, Paul F.: *See*—
Branz, Michael A.; and Renuad, Paul F., 4,612,775, Cl. 62-126.000.
Research Association for Utilization of Light Oil: *See*—
Ishida, Hiroshi; and Nakajima, Hitoshi, 4,613,717, Cl. 585-467.000.
Research Corporation: *See*—
Winston, Anthony; and Varaprasad, D. V. P. R., 4,613,616, Cl. 514-507.000.
Research Foundation of State University of New York, The: *See*—
Sachs, Frederick, 4,613,238, Cl. 374-174.000.
Reyes, Victor; and Kristensen, Eigil, to F. L. Smidth & Co. Energy control for electrostatic precipitator. 4,613,346, Cl. 55-4.000.
Reynolds, David F., to Barry Wright Corporation. Molded constant velocity coupling. 4,613,316, Cl. 464-85.000.
Reynolds, Randall H. Sail system with adjustable sail area. 4,612,868, Cl. 114-39.000.
Rheaume, Lisa J.: *See*—
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,613,503, Cl. 424-117.000.
Rheinmetall GmbH.: *See*—
Backstein, Guenter; and Unger, Hans W., 4,612,858, Cl. 102-245.000.
Furch, Benjamin; and Seidensticker, Jens, 4,612,859, Cl. 102-476.000.
Rhodes, Geoffrey O.: *See*—
Eckenrod, John J.; Pinnow, Kenneth E.; Rhodes, Geoffrey O.; and Royer, William E., 4,613,367, Cl. 420-42.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Leconte, Philippe, 4,613,702, Cl. 568-490.000.
Rhone-Poulenc Systemes: *See*—
Quang, Pham K.; and Kings, Donald H. M., 4,613,554, Cl. 430-39.000.
Rhythm Watch Co., Ltd.: *See*—
Nakamura, Norihiko, 4,613,236, Cl. 368-165.000.
Ribi ImmunoChem Research, Inc.: *See*—
Cantrell, John L., 4,613,504, Cl. 424-195.100.
Rice, Kenner C., to United States of America, Health and Human Services. Short total synthesis or morphinan compounds which uses cyclization of a cycloalkylcarbonyl compound selected from cyclopropylcarbonyl and cyclobutylcarbonyl. 4,613,668, Cl. 546-44.000.
Richard, Gordon L.: *See*—
Hough, Jack V. D.; Richard, Gordon L.; Barton, Kenneth E., Jr.; DiCarlo, Paul; and Chow, Robert Y., 4,612,915, Cl. 128-1.00R.
Richard Wolf GmbH: *See*—
Diener, Jorg; and Zobel, Jurgen, 4,613,232, Cl. 356-124.000.
Richards, Harvey J.: *See*—
Goel, Anil B.; Richards, Harvey J.; and Grimm, Robert A., 4,613,660, Cl. 528-73.000.
Richards, Paul L., to Whirlpool Corporation. Microcomputer control for microwave oven. 4,613,739, Cl. 219-10.55B.
Richardson, Jack: *See*—
Beck, Robert J.; and Richardson, Jack, 4,612,864, Cl. 109-49.500.
Ricoh Company, Ltd.: *See*—
Inaba, Norihiko; and Iiyama, Kiyotaka, 4,613,878, Cl. 346-204.000.
Riess, Jean; Jeanneaux, Francois; Le Blanc, Maurice; and Lantz, Andre , to Produits Chemiques Ugine Kuhlmann. Branched perfluoroalkyl-1,2-ethenes, their preparation and their use as oxygen carriers. 4,613,708, Cl. 570-136.000.
Riley, David A.: *See*—
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., 4,613,589, Cl. 514-23.000.
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., 4,613,590, Cl. 514-23.000.
Rinderle, Heinz; and Siegle, Martin, to Telefunken electronic GmbH. Multi-stage signal transmitting system. 4,613,823, Cl. 330-289.000.
Rinderle, Heinz, to Telefunken electronic GmbH. Selective amplifier having common base connected transistor and inductive input signal coupling. 4,613,824, Cl. 330-302.000.
Riniker, Bernhard: *See*—
Fuhrer, Walter; Buhlmayer, Peter; Rasetti, Vittorio; and Riniker, Bernhard, 4,613,676, Cl. 560-39.000.
Rippelton N.V.: *See*—
Nilsson, Jan-Ake I.; and Hansson, Bengt L., 4,612,865, Cl. 110-244.000.
Risen, William M., Jr.; and Kamitsos, Efstratios I., to Brown University Research Foundation. Processing of metallic charge-transfer salts. 4,613,553, Cl. 430-2.000.
Rispeter, Siegfried; and Schneider, Diethelm, to Dr. Ing. h.c.F. Porsche A.G. Body structure for motor vehicles, especially passenger motor vehicles. 4,613,184, Cl. 296-187.000.
Ritchie, Leonard C.: *See*—
Culican, Edward F.; Graf, Matthew C.; and Ritchie, Leonard C., 4,613,958, Cl. 365-189.000.
Rivers, Jacob B., Jr. Methods for dynamically refining and deodorizing fats and oils. 4,613,410, Cl. 203-39.000.
Riverside Energy Technology, Inc.: *See*—
Corren, Dean R.; and Miller, Gabriel, 4,613,279, Cl. 415-2.00A.
Roa, Pedro: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
Roadway Express, Inc.: *See*—
McKinney, P. Jay, 4,612,681, Cl. 15-49.00R.
Roaper, R. B.: *See*—
Staffin, H. Kenneth; and Roaper, R. B., 4,613,713, Cl. 585-241.000.
Robert Bosch GmbH: *See*—
Burkel, Rainer; and Zieher, Peter, 4,612,845, Cl. 91-448.000.
Herden, Werner; and Bloss, Werner, 4,613,789, Cl. 315-58.000.
Weitzel, Otto, 4,613,893, Cl. 358-11.000.
Robert Krups Stiftung & Co. KG.: *See*—
Henn, Stefan; and Flammann, Norbert, 4,612,836, Cl. 83-729.000.
Roberts, Simon. Pneumatic tire leak detector and method. 4,612,798, Cl. 73-40.700.
Roberts, Victor D., to General Electric Company. Integrated transformer and inductor. 4,613,841, Cl. 336-83.000.
Roberts, Victor D.: *See*—
Itani, Abdallah M.; and Roberts, Victor D., 4,613,795, Cl. 315-205.000.
Roberts, Wf. Dual purpose closure for heat exchangers. 4,612,980, Cl. 165-158.000.
Robertson, Jack R. Method for diagnosis of stress incontinence in women. 4,612,939, Cl. 128-774.000.
Robeson, Lloyd M.; Harris, James E.; and Michno, Michael J., Jr., to Union Carbide Corporation. Silicon carbide reinforcement of poly(aryl ether ketones). 4,613,645, Cl. 524-443.000.
Robinson, William H., II. Video control gloves. 4,613,139, Cl. 273-148.00B.
Rochat, Alain C.: *See*—
Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., 4,613,669, Cl. 546-167.000.
Rocher, Sylvain: *See*—
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, 4,613,450, Cl. 252-181.000.
Rockwell International Corporation: *See*—
Barkhoudarian, Sarkis, 4,612,797, Cl. 73-40.50R.
Fechalos, William A.; and Pitroda, Satyan G., 4,613,730, Cl. 179-81.00R.
Walter, Robert J.; and Marker, Harold E., 4,613,388, Cl. 148-425.000.
Rockwell-Rimoldi, S.p.A.: *See*—
Sanvito, Roberto, 4,612,866, Cl. 112-155.000.
Rodriguez, Otto: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
Roehrer, Kurt: *See*—
Lohrmann, Gerhard; and Roehrer, Kurt, 4,613,124, Cl. 271-16.000.
Roger, Pierre: *See*—
Choay, Patrick; Roger, Pierre; and Olliero, Dominique, 4,613,618, Cl. 514-538.000.
Rogers, Alfred N.; and Awerbuch, Leon, to Bechtel International Corporation. Separating gases from geopressured or hydropressured brine. 4,613,338, Cl. 23-301.000.
Rogers Corporation: *See*—
Traut, G. Robert; Keahey, Frank S., Jr.; Kozakoff, Dennis J.; Bethea, Paul M.; and Hensel, Joseph D., 4,613,540, Cl. 428-212.000.
Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,613,360, Cl. 71-124.000.
Rohr Industries, Inc.: *See*—
Adee, James M.; and Frye, John A., 4,612,737, Cl. 51-310.000.
Rojey, Alexandre: *See*—
Grehier, Alain; Rojey, Alexandre; and Benoist, Francois, 4,612,982, Cl. 165-166.000.
Roorda, John W., to Westek Associates. Tough-responsive electric light socket. 4,613,790, Cl. 315-72.000.
Roquette Freres: *See*—
Huchette, Michel; Fleche, Guy; and Gosset, Serge, 4,613,407, Cl. 162-175.000.
Rosa-Brussin, Marcos: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
Rosch, Joachim; Geisselmann, Heribert; and Wagner, Richard, to Pfaff Industriemaschinen GmbH. Method and apparatus for the pattern-correct sewing together of cloth parts. 4,612,867, Cl. 112-314.000.

Rose, Robert H. Apparatus for venting of dies in molding of thermoset plastic compounds. 4,613,110, Cl. 249-141.000.
Rose, Scott J.; Huettner, Rodney J.; and Hall, George H., to Stainless Steel Fabricating, Inc. Rotary cheese molder with improved cooling. 4,613,294, Cl. 425-438.000.
Rosemount Inc.: *See*—
Broden, David A., 4,612,812, Cl. 73-718.000.
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., to Abbott Laboratories. D-manno-2-octulosonic acid derivatives, pharmaceutical compositions and method of use. 4,613,589, Cl. 514-23.000.
Rosenbrook, William; Lartey, Paul A.; and Riley, David A., to Abbott Laboratories. Amino D-manno-2-octulopyranosidonate containing compounds, pharmaceutical compositions and method of use. 4,613,590, Cl. 514-23.000.
Rosser, Robert. Knot tying jig. 4,613,173, Cl. 289-17.000.
Rossi, Mario; and Gaboardi, Angelo, to Honeywell Information Systems Italia. Wire matrix printer with damping means. 4,613,243, Cl. 400-124.000.
Rossi, Pier P.; and Marchetti, Salvatore, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Preparation of unsaturated or saturated α, ω-dialdehydes and α, ω-diacids. 4,613,694, Cl. 562-590.000.
Rossow, Harold E.: *See*—
Lane, George A.; and Rossow, Harold E., 4,613,444, Cl. 252-70.000.
Roth, Donald J.: *See*—
Walter, John; Roth, Donald J.; and Kubis, Charles S., 4,613,062, Cl. 222-146.200.
Roth, Kevin A.: *See*—
Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., 4,613,586, Cl. 514-13.000.
Roumegoux, Jean-Louis: *See*—
Massard, Christian; Pierre, Alain; and Roumegoux, Jean-Louis, 4,612,736, Cl. 51-284.00E.
Roussel UCLAF: *See*—
Godbille, Etienne, 4,613,405, Cl. 159-13.300.
Royer, William E.: *See*—
Eckenrod, John J.; Pinnow, Kenneth E.; Rhodes, Geoffrey O.; and Royer, William E., 4,613,367, Cl. 420-42.000.
Rubbo, Richard P.; and Haugen, David M., to Baker Oil Tools, Inc. Seal assembly for well tools. 4,612,985, Cl. 166-114.000.
Ruben, Samuel. Cell cathode material. 4,613,552, Cl. 429-224.000.
Ruckert, Carl A. Bowling ball. 4,613,137, Cl. 273-63.00R.
Rudman, Peter: *See*—
Welter, Jean-Marie; and Rudman, Peter, 4,613,362, Cl. 75-0.50B.
Ruhberg, David L.: *See*—
Bush, John M.; and Ruhberg, David L., 4,613,953, Cl. 364-900.000.
Ruhle, Gunter, to GETRAG Getriebe-und Zahnradfabrik GmbH. Transmission system. 4,612,824, Cl. 74-665.00F.
Ruhle, James L. Apparatus for excavating bore holes in rock. 4,613,003, Cl. 175-324.000.
Rummelsburg, Al. S., to Kidde Consumer Durables Corp. Method of making cookware. 4,613,070, Cl. 228-231.000.
Runciman, Herbert M.: *See*—
Bagnall-Wild, Ralph H.; and Runciman, Herbert M., 4,613,898, Cl. 358-87.000.
Rusch, Reinhart, to Schering Aktiengesellschaft. Composition for defoliating plants. 4,613,354, Cl. 71-73.000.
Rush, Richard R. Quick change device for a basketball goal. 4,613,135, Cl. 273-1.50R.
Rushforth, Craig K.: *See*—
Currie, Robert J.; Rushforth, Craig K.; and Zscheile, John W., Jr., 4,613,860, Cl. 340-825.570.
Russow, Jurgen: *See*—
Kau, Heinz; and Russow, Jurgen, 4,613,416, Cl. 204-98.000.
Rutgers Research and Educational Foundation: *See*—
MacKay, Vivian L.; and Manney, Thomas R., 4,613,572, Cl. 435-253.000.
S. C. Johnson & Son, Inc.: *See*—
Sandvick, Paul E., 4,613,646, Cl. 524-476.000.
Sabon, Thomas W.: *See*—
Kraus, Richard A.; and Sabon, Thomas W., 4,613,802, Cl. 318-483.000.
Sacchetti, John A.; Tordella, Joseph R.; and Pellegrino, Arthur J. Closure. 4,613,057, Cl. 221-265.000.
Sachs, Frederick, to Research Foundation of State University of New York, The. Method and apparatus for measuring temperature of ultra small areas. 4,613,238, Cl. 374-174.000.
Sackmann, Gunter: *See*—
Hendricks, Udo W.; Lesche, Klaus; Sackmann, Gunter; and Schroer, Wolf-Dieter, 4,613,337, Cl. 8-543.000.
Sacks, Clifford E., to Upjohn Company, The. Process and intermediates for the preparation of 17 alphahydroxyprogesterones and corticoids from an enol steroid. 4,613,463, Cl. 540-94.000.
Sadofsky, Robert: *See*—
Di Stefano, Thomas H.; and Sadofsky, Robert, 4,613,966, Cl. 369-100.000.
Saeki, Takashi; and Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Process for producing plastic concrete. 4,613,649, Cl. 524-650.000.
Safety-Kleen Corporation: *See*—
Dingess, John A., 4,613,449, Cl. 252-174.170.
Saffer, Edmund: *See*—
Dornheim, Hans-Peter; and Saffer, Edmund, 4,613,982, Cl. 378-37.000.
Saijo, Yoshiaki: *See*—
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,612,946, Cl. 134-62.000.
Saito, Ikuo; Minakata, Ryosuke; and Suzuki, Yukio, to Nikkodo Co., Ltd.; and Marantz Japan Inc. Compact disc case. 4,613,044, Cl. 206-444.000.
Saito, Morikuni: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, 4,613,879, Cl. 346-209.000.
Saito, Sadayuki; Hamada, Shunji; Iwamura, Tadaaki; and Takabe, Ryoji, to Kawasaki Steel Corporation. Apparatus for blowing powdery refining agent into refining vessel. 4,613,113, Cl. 266-83.000.
Saito, Susumu: *See*—
Okada, Kunihiro; Endo, Hirohide; and Saito, Susumu, 4,613,753, Cl. 250-236.000.
Saito, Yoshio: *See*—
Seshimoto, Osamu; Saito, Yoshio; Koizumi, Teruaki; and Terashima, Masaaki, 4,613,420, Cl. 204-412.000.
Seshimoto, Osamu; Koizumi, Teruaki; Saito, Yoshio; and Yamaguchi, Akira, 4,613,421, Cl. 204-412.000.
Saito, Yukio: *See*—
Shimaoka, Motohiro; and Saito, Yukio, 4,613,917, Cl. 360-97.000.
Sakamoto, Takurou: *See*—
Nakayama, Takeo; Fujinami, Kimiya; Sakamoto, Takurou; and Doura, Fumihiro, 4,613,652, Cl. 525-276.000.
Sakane, Seishiro: *See*—
Nakajima, Motoharu; Sakane, Seishiro; Sato, Norimichi; and Haruta, Etsuro, 4,612,734, Cl. 51-170.0PT.
Sakata, Norihiko; and Miura, Nobuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Vinylidene chloride type resin expandable particles, foam particles, in-mold foam molding by use thereof and process for producing them. 4,613,626, Cl. 521-60.000.
Sakurai, Junji, to Fujitsu Limited. Horizontal furnace with a suspension cantilever loading system. 4,613,305, Cl. 432-253.000.
Sakurai, Toshio: *See*—
Noma, Kouichi; Matsuda, Kazuto; and Sakurai, Toshio, 4,612,777, Cl. 62-247.000.
Salanki, Tibor; and Hess, Norbert, to Siemens Aktiengesellschaft. Electrical insulator column with fiber optic cable and gas supply tube. 4,613,727, Cl. 174-30.000.
Salzer, Heinrich. Frame construction and profile sections forming same. 4,612,743, Cl. 52-208.000.
Sampei, Tohru: *See*—
Higuchi, Shigemitsu; Konno, Kazutoshi; and Sampei, Tohru, 4,613,920, Cl. 360-121.000.
Sances, Anthony, Jr.: *See*—
Battocletti, Joseph H.; Halbach, Richard E.; Antonich, Frederick J.; Sances, Anthony, Jr.; and Knox, Thomas A., 4,613,818, Cl. 324-306.000.
Sandberg, Ulrik: *See*—
Nilsson, Nils-Olov; Andersson, Ingmar; Sandberg, Ulrik; and Karlsson, Eils, 4,613,376, Cl. 106-282.000.
Sanden Corporation: *See*—
Kanazashi, Takeshi; and Kanbe, Toru, 4,612,850, Cl. 99-289.00R.
Sanders, Anthony J., to Black & Decker Inc. End cap assembly and brush box an electric motor. 4,613,781, Cl. 310-239.000.
Sanders, Calvin E. Organizer clip device. 4,612,685, Cl. 24-67.900.
Sanders, Royden C., Jr.: *See*—
Forsyth, John L., 4,613,242, Cl. 400-124.000.
Sanderson, Roger S.: *See*—
Whelchel, Robert C.; and Sanderson, Roger S., 4,612,872, Cl. 116-218.000.
Sanderson, William R., to Interox Chemicals Limited. Aqueous acidic hydrogen peroxide composition containing enol ester activator. 4,613,452, Cl. 252-186.230.
Sandman, Daniel J.; Stark, James C.; and Acampora, Lewis A., to GTE Laboratories Incorporated. Method for preparing aromatic and olefinic organoselenium and organotellurium compounds. 4,613,468, Cl. 260-550.000.
Sandoz Ltd.: *See*—
Lee, Shy-Fuh, 4,613,675, Cl. 558-170.000.
Sandoz Pharmaceuticals Corp.: *See*—
Wareing, James R., 4,613,610, Cl. 514-406.000.
Sandvick, Paul E., to S. C. Johnson & Son, Inc. Cleaning and polishing compositions. 4,613,646, Cl. 524-476.000.
Sankyo Company Limited: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.
Sanofi: *See*—
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , 4,613,603, Cl. 514-242.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Suzuki, Tomonori; and Toyohara, Makoto, 4,613,310, Cl. 440-76.000.
Sanvito, Roberto, to Rockwell-Rimoldi, S.p.A. Sewing machine with a bridge-type structure. 4,612,866, Cl. 112-155.000.
Sanyo Electric Co., Ltd.: *See*—
Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, 4,613,880, Cl. 357-2.000.
Noma, Kouichi; Matsuda, Kazuto; and Sakurai, Toshio, 4,612,777, Cl. 62-247.000.
Sumi, Yasuaki, 4,613,799, Cl. 318-314.000.

Sapienza, Richard S.: *See*—
Mahajan, Devinder; Slegeir, William A.; Sapienza, Richard S.; and O'Hare, Thomas E., 4,613,623, Cl. 518-700.000.
Sarasohn, Niel L., to Gentran, Inc. Temperature compensating pressure gage. 4,612,811, Cl. 73-706.000.
Sasaki, Seishi: *See*—
Kanai, Kenji; Sasaki, Seishi; Takahashi, Ken; and Sugita, Ryuji, 4,613,918, Cl. 360-113.000.
Sasib S.p.A.: *See*—
Manservisi, Renato; and Cavicchi, Dario, 4,612,803, Cl. 73-81.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, to Esai Co., Ltd.; and General Director of the Agency of Industrial Science and Technology. Polyprenyl sulfone derivatives and process for producing the same. 4,613,571, Cl. 435-130.000.
Sato, Eiji; Fukuda, Tamio; Ishii, Masaharu; Nakamura, Mitsuru; and Nakamura, Yozo, to Hitachi, Ltd. Piston stroke control device for free piston type oscillating compressors. 4,613,285, Cl. 417-214.000.
Sato, Hideaki: *See*—
Ichikawa, Izumi; and Sato, Hideaki, 4,613,964, Cl. 369-45.000.
Sato, Hiroki: *See*—
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,612,822, Cl. 74-493.000.
Sato, Norimichi: *See*—
Nakajima, Motoharu; Sakane, Seishiro; Sato, Norimichi; and Haruta, Etsuro, 4,612,734, Cl. 51-170.0PT.
Sato, Shinichi: *See*—
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,612,946, Cl. 134-62.000.
Sato, Yoshihiko: *See*—
Ishida, Shiro; Sato, Yoshihiko; and Konagaya, Isao, 4,612,888, Cl. 123-261.000.
Sato, Yoshimi, to Nissan Motor Co., Ltd. Slide door opening/closing apparatus for automotive vehicle. 4,612,729, Cl. 49-362.000.
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, to Nippondenso Co., Ltd. Control system for an engine having air passage. 4,612,894, Cl. 123-494.000.
Satoshi Omura: *See*—
Omura, Satoshi; Tanaka, Haruo; Hinotozawa, Kiyoizumi; Murata, Masatsune; and Iwai, Yuzuru, 4,613,355, Cl. 71-86.000.
Saucy, Jeannette E. Garment drying form comprising flexible, conformable mesh insert body. 4,613,066, Cl. 223-66.000.
Sauer, Hans: *See*—
Yabu, Hisao; Tsuji, Kenji; and Hirabayashi, Akinori, 4,613,840, Cl. 335-128.000.
Savage, David S.: *See*—
Sleigh, Thomas; Savage, David S.; and Clark, John K., 4,613,619, Cl. 514-546.000.
Saville, Russell H., to Savillex. Microwave heating digestion vessel. 4,613,738, Cl. 219-10.55R.
Savillex: *See*—
Saville, Russell H., 4,613,738, Cl. 219-10.55R.
Sawafuji, Takashi: *See*—
Matsuo, Yukito; Tamada, Masuo; Sawafuji, Takashi; and Azukizawa, Teruo, 4,613,805, Cl. 318-687.000.
Scarborough, Jimmy M. Process and apparatus for joining carpeting. 4,613,396, Cl. 156-391.000.
SCD Incorporated: *See*—
Kasevich, Raymond S.; Dwyer, Arthur S.; and Guerreri, Bart G., 4,612,940, Cl. 128-804.000.
Schachter, Rozalie: *See*—
Parry, Robert W.; Baumann, John A.; and Schachter, Rozalie, 4,613,485, Cl. 422-173.000.
Schadt, Martin: *See*—
Boller, Arthur; Germann, Alfred; Petrzilka, Martin; and Schadt, Martin, 4,613,208, Cl. 350-349.000.
Schafer, Paul: *See*—
Berendt, Hans-Ulrich; and Schafer, Paul, 4,613,335, Cl. 8-477.000.
Schairer, Werner, to Telefunken electronic GmbH. Alloyed contact for n-conducting GaAlAs-semi-conductor material. 4,613,890, Cl. 357-67.000.
Schaper, Ulf-Armin: *See*—
Blosl, Siegfried; Bruns, Klaus; and Schaper, Ulf-Armin, 4,613,457, Cl. 252-522.00R.
Scharer, Roger M., to General Binding Corporation. Guide apparatus for use with punching and binding machines. 4,613,266, Cl. 412-40.000.
Scharfenberg, Randolph E.: *See*—
Philpot, James R.; and Scharfenberg, Randolph E., 4,613,112, Cl. 251-149.600.
Schattmaier, Kurt, to Cejn AG. Releasable plug-in socket pipe coupling. 4,613,172, Cl. 285-340.000.
Scheiber, David H.: *See*—
Dueber, Thomas E.; Scheiber, David H.; and Simmons, Howard E., III, 4,613,560, Cl. 430-286.000.
Schenkel, Hans: *See*—
Skaria, Arankathu; Stark, Reiner; and Schenkel, Hans, 4,613,493, Cl. 423-489.000.
Schering A. G.: *See*—
Diamond, Julius; Lumma, William C., Jr.; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,613,609, Cl. 514-396.000.
Schering Aktiengesellschaft: *See*—
Rusch, Reinhart, 4,613,354, Cl. 71-73.000.
Schimmel, Morry L., to McDonnell Douglas Corporation. Ballistic gas fired device. 4,612,857, Cl. 102-204.000.
Schmid-Welti AG: *See*—
Schmid-Welti, Erich, 4,612,950, Cl. 137-116.500.
Schmid-Welti, Erich, to Schmid-Welti AG. Pressure measuring and regulating device. 4,612,950, Cl. 137-116.500.
Schmidt, Dieter, to HTS-Elektrotechnik GmbH. Manual crimping pliers. 4,612,794, Cl. 72-410.000.
Schmidt, Gunther: *See*—
Deserno, Ulrich; and Schmidt, Gunther, 4,613,757, Cl. 250-458.100.
Schmidtchen, Hans-Martin, to Kabel- und Metallwerke Gutehoffnungshuette. Connecting concentric tube systems. 4,613,166, Cl. 285-53.000.
Schmitz, Peter J.: *See*—
Moss, Alvin; Shepherd, Charles G.; Malcolm, Craig G.; Malcolm, Richard E.; and Schmitz, Peter J., 4,613,006, Cl. 180-9.250.
Schneider, Diethelm: *See*—
Rispeter, Siegfried; and Schneider, Diethelm, 4,613,184, Cl. 296-187.000.
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, to Sud-Chemie Aktiengesellschaft. Catalyst for the production of synthesis gas or hydrogen and process for the production of the catalyst. 4,613,584, Cl. 502-304.000.
Schnepple, Wayne F.: *See*—
Iwanczyk, Jan S.; Barton, Jeff B.; Dabrowski, Andrzej J.; and Schnepple, Wayne F., 4,613,756, Cl. 250-361.00R.
Schnurer, John W., to Hoover, Ralph H., a part interest. Wood-burning heater for circulating water. 4,612,878, Cl. 122-15.000.
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, to BASF Aktiengesellschaft. Plate spring for a tape cassette. 4,613,095, Cl. 242-198.000.
Scholte, Bob, to Tobo Made B.V. Detachable towing bracket. 4,613,148, Cl. 280-491.00E.
Schorfheide, James J., to Exxon Research and Engineering Co. Catalytic reforming process. 4,613,424, Cl. 208-65.000.
Schrack, Michael E. Protective head gear. 4,612,672, Cl. 2-68.000.
Schreiber, William L.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,613,706, Cl. 568-322.000.
Schrenk, Hannes. Filler body for receptacles for combustible fluids and method of making same. 4,613,054, Cl. 220-88.00R.
Schroeder, Albert H.: *See*—
Papir, Yoram S.; and Schroeder, Albert H., 4,613,211, Cl. 350-357.000.
Schroeder, Charles H.; and Farnham, Larry. Exercise bicycle attachment. 4,613,129, Cl. 272-73.000.
Schroeder, Jack A.; Carraher, Charles E., Jr.; and Schwarz, Richard A., to Wright State University. Group IVB metal containing polydyes. 4,613,670, Cl. 549-211.000.
Schroer, Wolf-Dieter: *See*—
Hendricks, Udo W.; Lesche, Klaus; Sackmann, Gunter; and Schroer, Wolf-Dieter, 4,613,337, Cl. 8-543.000.
Schubert, Ernst W.; and Gebhardt, Peter, to Dragerwerk AG. Attachment for the supply of breathing gas for high-frequency artificial respiration. 4,612,929, Cl. 128-204.250.
Schulze, Walter A.: *See*—
Haun, Michael J.; Newnham, Robert E.; and Schulze, Walter A., 4,613,784, Cl. 310-358.000.
Schulze, Werner, to Alfred Karcher GmbH & Co. Process for controlling a high-pressure cleaner and high-pressure cleaner for implementing said process. 4,613,074, Cl. 239-1.000.
Schumacher, Gunter: *See*—
Schumacher, Gustav, II; and Schumacher, Gunter, 4,612,758, Cl. 56-310.000.
Schumacher, Gustav, II; and Schumacher, Gunter. Cutting finger for finger-bar cutters. 4,612,758, Cl. 56-310.000.
Schuppert, Leo V., Jr.: *See*—
Loomis, Phillip E.; Paukovits, Edward J., Jr.; Schuppert, Leo V., Jr.; and Spong, Richard V., 4,612,700, Cl. 29-564.600.
Schwab, Philippe: *See*—
Genequand, Pierre; and Schwab, Philippe, 4,613,105, Cl. 248-178.000.
Schwartz, Edward J., to Fulton Manufacturing Corporation. Adjustable conduit clamp. 4,613,249, Cl. 403-3.000.
Schwarz, Horst: *See*—
Hausler, Dietrich; and Schwarz, Horst, 4,613,088, Cl. 241-197.000.
Schwarz, Richard A.: *See*—
Schroeder, Jack A.; Carraher, Charles E., Jr.; and Schwarz, Richard A., 4,613,670, Cl. 549-211.000.
Schwehr, Gregory D.: *See*—
Heitman, Christopher J.; and Schwehr, Gregory D., 4,613,926, Cl. 362-32.000.
Schweitzer, William K. Tread roller apparatus. 4,613,094, Cl. 242-86.520.
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., to Life Light Systems. Emergency signal. 4,613,847, Cl. 340-114.00R.
Scott, Floyd L., Jr.: *See*—
Pittman, Paul R.; Scott, Floyd L., Jr.; and Hamilton, William R., 4,613,002, Cl. 175-107.000.
Scott, John N., Jr.: *See*—
Ayres, C. A.; Scott, John N., Jr.; and Sherk, Fred T., 4,613,484, Cl. 422-132.000.
Scott, Norman L.: *See*—
Gloppen, Edward C.; and Scott, Norman L., 4,612,751, Cl. 52-723.000.
Seelen-Kruijssen, Josepha M. E.: *See*—
Van Erp, Willibrord A.; Seelen-Kruijssen, Josepha M. E.; and Huizinga, Tom, 4,613,488, Cl. 423-328.000.

Segalman, Daniel J., to Atlantic Richfield Company. Dual aquafer electrical heating of subsurface hydrocarbons. 4,612,988, Cl. 166-248.000.

Seidensticker, Jens: *See*—
Furch, Benjamin; and Seidensticker, Jens, 4,612,859, Cl. 102-476.000.

Seiji, Shibuya; Tuguo, Satoh; Wataru, Komatsu; and Takeo, Shimuzu, to Furukawa Electric Co., Ltd. Image fiber and method of fabricating base material for the same. 4,613,205, Cl. 350-96.250.

Seiko Instruments & Electronics Ltd.: *See*—
Yoshikawa, Haruzo, 4,612,841, Cl. 84-484.000.

Seikosha Co., Ltd.: *See*—
Ikeda, Yoshiaki; Tamura, Yoshio; Nanri, Masahiko; and Onizuka, Yasuki, 4,613,245, Cl. 400-313.000.

Seikow Chemical Engineering & Machinery, Ltd.: *See*—
Kotera, Masayuki, 4,613,289, Cl. 417-420.000.

Sekine, Kunio: *See*—
Suzuki, Yoshiki; Sekine, Kunio; Nagai, Tsuneji; Nambu, Naoki; and Nishimoto, Yuji, 4,613,500, Cl. 429-85.000.

Sekiya, Masayoshi; and Harada, Koichi, to Nippon Zeon Co., Ltd. Copolymer latex. 4,613,633, Cl. 523-201.000.

Sekiya, Masayoshi; Ishizuka, Toshiro; Maeda, Daiharu; Miyamoto, Kenzo; and Shimazoe, Takahiro, to Nippon Zeon Co., Ltd. Copolymer latex. 4,613,650, Cl. 524-828.000.

Selberg, Roberto B. O.; Kronogard, N. Hakan; and Cockin, John, to M.A. Golf Training International AB. Golf practice driving device. 4,613,133, Cl. 273-195.00B.

Sellstrom, Kathy B.: *See*—
McEntire, Edward E.; and Sellstrom, Kathy B., 4,613,673, Cl. 556-100.000.

Selvin, Gerald J.; and Espiritu, Hermenegildo A., to International Telephone & Telegraph Corporation. Electrical connector backshell. 4,613,198, Cl. 339-141.000.

Senmed, Inc.: *See*—
Brinkerhoff, Ronald J.; and Nobis, Rudolph H., 4,612,933, Cl. 128-334.00R.

Separex Corporation: *See*—
Wight, William W.; and Becker, Richard A., 4,613,436, Cl. 210-232.000.

Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, to Intevep, S.A.; and Universidad Central de Venezuela. Process for the demetallization and hydroconversion of heavy crudes and residues using a natural clay catalyst. 4,613,427, Cl. 208-111.000.

Serpeau, Patrick: *See*—
Herbec, Jean-Pierre; Laisney, Michel; Murat, Jacques; and Serpeau, Patrick, 4,613,216, Cl. 350-618.000.

Serval, Eric: *See*—
Ranchet, Jean. P.; and Serval, Eric, 4,613,347, Cl. 55-53.000.

Seshimoto, Osamu; Saito, Yoshio; Koizumi, Teruaki; and Terashima, Masaaki, to Fuji Photo Film Co., Ltd. Apparatus for measuring ionic activity. 4,613,420, Cl. 204-412.000.

Seshimoto, Osamu; Koizumi, Teruaki; Saito, Yoshio; and Yamaguchi, Akira, to Fuji Photo Film Co., Ltd. Apparatus for measuring ionic activity. 4,613,421, Cl. 204-412.000.

Severson, Gerald R.; and Wade, Richard C., to Motorola, Inc. Tubular switch package with sliding contacts forming a portion thereof. 4,613,735, Cl. 200-158.000.

Sewerinson, Ake; and Hellquist, Andrew V., to British Columbia Telephone Company. Constant envelope offset QPSK modulator. 4,613,976, Cl. 375-52.000.

SFE Technologies: *See*—
Ham, Mooyoung; and Duffy, John W., 4,613,518, Cl. 427-38.000.

Shamash, Jack E. Method, components, and system for assembling buildings. 4,612,744, Cl. 52-220.000.

Shape Inc.: *See*—
Klar, Robert H.; and Lord, Jeffery R., 4,613,392, Cl. 156-235.000.

Shappir, Joseph: *See*—
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,613,882, Cl. 357-23.300.

Sharbaugh, John E., to Westinghouse Electric Corp. Plenum separator system for pool-type nuclear reactors. 4,613,478, Cl. 376-290.000.

Sharman, Stephen G.: *See*—
Ashton, Michael C.; Bish, Derek A.; and Sharman, Stephen G., 4,612,968, Cl. 164-34.000.

Sharp Kabushiki Kaisha: *See*—
Handa, Tamami; and Shimizu, Eiichi, 4,613,126, Cl. 271-267.000.
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,613,944, Cl. 364-513.500.
Hashimoto, Shintaro; and Yoshida, Hideo, 4,613,985, Cl. 381-51.000.

Sharp, Timothy M.; and Stephan, Donald C. Monocoque bicycle frame. 4,613,146, Cl. 280-281.00B.

Shaw, Anthony; and Zuckerbrod, Jesse, to D. Klein & Son, Inc. Drop bottom garment bag. 4,613,039, Cl. 206-287.100.

Shaw, Benjamin C., to Allied Corporation. Digital drive system for pulse width modulated power control. 4,613,933, Cl. 363-55.000.

Shaw, James E., to Phillips Petroleum Co. Oil recovery process. 4,612,991, Cl. 166-273.000.

Shaw, Richard J.: *See*—
Hayes, Norman J.; and Shaw, Richard J., 4,612,877, Cl. 119-156.000.

Shaw, Wilfrid G.: *See*—
Pedersen, S. Erik; Shaw, Wilfrid G.; and Pfingsten, Linda L., 4,613,711, Cl. 585-411.000.

Shea, Thomas M. Cutting and scraping device. 4,612,707, Cl. 30-162.000.

Shell Mining Company: *See*—
Erian, Fadel F., 4,612,800, Cl. 73-54.000.

Shell Oil Company: *See*—
Moore, Boyd B., 4,612,993, Cl. 166-335.000.
Van Erp, Willibrord A.; Seelen-Kruijssen, Josepha M. E.; and Huizinga, Tom, 4,613,488, Cl. 423-328.000.
Vinegar, Harold J.; and Wellington, Scott L., 4,613,754, Cl. 250-252.100.

Shenton, Graham; Jones, Ioan G.; Lucas, David W.; and Barton, Ronald E., to International Microelectronic Products. Method and structure for use in designing and building electronic systems in integrated circuits. 4,613,940, Cl. 364-490.000.

Shepherd, Charles G.: *See*—
Moss, Alvin; Shepherd, Charles G.; Malcolm, Craig G.; Malcolm, Richard E.; and Schmitz, Peter J., 4,613,006, Cl. 180-9.250.

Sherk, Fred T.: *See*—
Ayres, C. A.; Scott, John N., Jr.; and Sherk, Fred T., 4,613,484, Cl. 422-132.000.

Sherman, Norman; and Underbakke, Timara, to USG Acoustical Products Company. Process for the manufacture of shaped fibrous products and the resultant product. 4,613,627, Cl. 521-68.000.

Sherwood Medical Company: *See*—
Bodicky, Raymond O., 4,613,329, Cl. 604-158.000.

Sherwood, Richard C.; Tabor, William J.; Vogel, Eva M.; and Zappulla, Robert, to AT&T Bell Laboratories. Bias magnet temperature tracking of magnetic bubble memories. 4,613,955, Cl. 365-27.000.

Sheth, Jayesh V., to Burroughs Corporation. Block counter system to monitor data transfers. 4,613,954, Cl. 364-900.000.

Shewmon, Daniel C. Structures and methods of forming sea anchors. 4,612,870, Cl. 114-311.000.

Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, to Nissan Motor Co., Ltd. Stabilizer for an automotive vehicle. 4,613,153, Cl. 280-689.000.

Shibamoto, Takeshi: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Shibata, Akira; Yoshioka, Atsushi; and Watanabe, Katsuyuki, to Hitachi, Ltd. Recording and reproducing apparatus for a video tape recorder. 4,613,912, Cl. 360-19.100.

Shibata, Tadahiko: *See*—
Hibi, Yasuo; Shibata, Tadahiko; and Iwase, Takatoshi, 4,613,034, Cl. 198-465.100.

Shibata, Tomoyuki: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.

Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, to Hitachi, Ltd.; and Hitachi Electronics Engineering Co., Ltd. Automatic bacterial colony transfer apparatus. 4,613,573, Cl. 435-289.000.

Shichijo, Hajime; Tsukatani, Masamitsu; and Kato, Takeshi, to Sony Corporation. Operating panel. 4,613,736, Cl. 200-317.000.

Shiga, Norio: *See*—
Okabayashi, Mitumasa; and Shiga, Norio, 4,613,244, Cl. 400-175.000.

Shiiki, Zenya: *See*—
Katto, Takayuki; Kouyama, Toshitaka; Iwasaki, Takao; and Shiiki, Zenya, 4,613,654, Cl. 525-537.000.

Shimada, Toshikazu: *See*—
Katayama, Yoshifumi; Shimada, Toshikazu; and Maruyama, Eiichi, 4,613,382, Cl. 148-1.500.

Shimamoto, Yosuke: *See*—
Takita, Nobuhiro; Shimamoto, Yosuke; Tada, Hiroichi; and Tamura, Yutaka, 4,613,896, Cl. 358-76.000.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,613,319, Cl. 474-80.000.

Shimaoka, Motohiro; and Saito, Yukio, to Alps Electric Co., Ltd. Recording and reproducing device. 4,613,917, Cl. 360-97.000.

Shimazoe, Takahiro: *See*—
Sekiya, Masayoshi; Ishizuka, Toshiro; Maeda, Daiharu; Miyamoto, Kenzo; and Shimazoe, Takahiro, 4,613,650, Cl. 524-828.000.

Shimizu, Eiichi: *See*—
Handa, Tamami; and Shimizu, Eiichi, 4,613,126, Cl. 271-267.000.

Shimizu, Yasufumi: *See*—
Masuko, Akinori; Kuroiwa, Wataru; Shimizu, Yasufumi; and Hirosawa, Hideki, 4,613,826, Cl. 331-14.000.

Shimura, Atsushi: *See*—
Umeha, Genkichi; Fujita, Yoshiaki; and Shimura, Atsushi, 4,612,695, Cl. 29-505.000.

Shin Nisso Kako Co., Ltd.: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, 4,613,879, Cl. 346-209.000.

Shinko Electric Co., Ltd.: *See*—
Nakajima, Motoharu; Sakane, Seishiro; Sato, Norimichi; and Haruta, Etsuro, 4,612,734, Cl. 51-170.0PT.

Shinopulos, George: *See*—
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,612,971, Cl. 164-454.000.

Shintani, Akinori: *See*—
Yamanishi, Kazuhiko; Shintani, Akinori; Okajima, Satoru; and Hanada, Toshiro, 4,613,465, Cl. 260-394.000.
Shirono, Katsuhiro: *See*—
Higashi, Hidehiro; Shirono, Katsuhiro; Arima, Yuusaku; Nishimura, Yoichi; and Yoshida, Shinichi, 4,613,425, Cl. 208-89.000.
Shishido, Toshihiko, to Morinaga & Co., Ltd. Process for producing filled hard dough biscuits. 4,613,508, Cl. 426-281.000.
Shoemaker, Fred N. Magnetic oil filter. 4,613,435, Cl. 210-222.000.
Shoji, Kazunori: *See*—
Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, 4,613,084, Cl. 241-16.000.
Shortle, Martin C.; and Lobb, Daniel R., to Dwight Cavendish Co., Ltd. Light projection apparatus. 4,613,201, Cl. 350-6.100.
Shotwell, Duane E., to Hughes Tool Company - USA. Earth boring bit with labyrinth seal protector. 4,613,004, Cl. 175-371.000.
Showa Denko Kabushiki Kaisha: *See*—
Inoue, Chozo; Kurima, Yoshiko; and Moriguchi, Soyao, 4,613,688, Cl. 562-401.000.
Shu, Winston R., to Mobil Oil Corporation. Method for diverting steam in thermal recovery process. 4,612,990, Cl. 166-272.000.
Shubert, William K.: *See*—
Hansen, Donald F.; and Shubert, William K., 4,613,938, Cl. 364-420.000.
Si Handling Systems, Inc.: *See*—
Lindquist, Per E., 4,612,861, Cl. 104-166.000.
Sibuet, Rene : *See*—
Paquet, Jean-Marc; and Sibuet, Rene , 4,613,111, Cl. 251-46.000.
Siddall, Graham J.; Eaton, Steven G.; Kruger, James B.; Garrettson, Garrett A.; and Neukermans, Armand P., to Varian Associates, Inc. Method and apparatus for lithographic rotate and repeat processing. 4,613,981, Cl. 378-34.000.
Sidransky, Fred S., to Sundstrand Corporation. Inlet construction for a scroll compressor. 4,613,291, Cl. 418-15.000.
Siegle, Martin: *See*—
Rinderle, Heinz; and Siegle, Martin, 4,613,823, Cl. 330-289.000.
Siemens Aktiengesellschaft: *See*—
Baisch, Roderich; Gose, Horst; and Papiernik, Wolfgang, 4,612,709, Cl. 33-125.00R.
Brugger, Rudolf; Jonke, Gerhard; and Steinmann, Peter, 4,613,214, Cl. 350-511.000.
Brumme, Gerhard; Grage, Ludger; Heynisch, Hinrich; and Hubner, Erwin, 4,613,971, Cl. 372-87.000.
Daisenberger, Georg, 4,613,729, Cl. 179-8.00A.
Deserno, Ulrich; and Schmidt, Gunther, 4,613,757, Cl. 250-458.100.
Dornheim, Hans-Peter; and Saffer, Edmund, 4,613,982, Cl. 378-37.000.
Eckert, Guenther; and Singer, Franz, 4,613,734, Cl. 200-144.00R.
Hahn, Alfred, 4,613,121, Cl. 269-322.000.
Heitzig, Claus-Peter, 4,612,979, Cl. 165-129.000.
Hoenig, Eckhardt, 4,613,817, Cl. 324-248.000.
Hosemann, Gerhard, 4,613,807, Cl. 318-807.000.
Kobsle, Manfred; Trausch, Gunter; and Wengert, Rolf, 4,613,399, Cl. 156-634.000.
Mammach, Peter, 4,613,312, Cl. 445-25.000.
Patalong, Hubert, 4,613,766, Cl. 307-252.00A.
Salanki, Tibor; and Hess, Norbert, 4,613,727, Cl. 174-30.000.
Tihanyi, Jenoe, 4,613,883, Cl. 357-23.400.
Siemens Medical Laboratories, Inc.: *See*—
Miller, Lawrence R., 4,612,937, Cl. 128-663.000.
Siemon Company, The: *See*—
Pohl, Karl-Heinz, 4,613,194, Cl. 339-19.000.
Sigmatron Nova, Inc.: *See*—
Panicker, Ramachandra M. P.; and Essinger, Walter F., 4,613,793, Cl. 315-169.300.
Silber, Dieter: *See*—
Angerstein, Jorg; and Silber, Dieter, 4,613,884, Cl. 357-39.000.
Simandi, Laszlo : *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.
Simmons, Howard E., III: *See*—
Dueber, Thomas E.; Scheiber, David H.; and Simmons, Howard E., III, 4,613,560, Cl. 430-286.000.
Simon, Georges: *See*—
Marcon, Joel; Durant, Jacques; Simon, Georges; and Boisseau, Alain, 4,612,843, Cl. 89-33.040.
Simonsen, Knud. Comminuting machine with feed worm, especially for comminuting frozen meat. 4,613,085, Cl. 241-82.500.
Simpson, David, to Insta-Hut Inc. Portable shelter or tent enclosure, structures and components therefor. 4,612,948, Cl. 135-112.000.
Simpson, Kenneth N. Burner safety system. 4,613,300, Cl. 431-153.000.
Singer Company, The: *See*—
Franke, Sr., John, 4,613,123, Cl. 271-18.300.
Weisz, William, 4,612,821, Cl. 74-483.0PB.
Singer, Franz: *See*—
Eckert, Guenther; and Singer, Franz, 4,613,734, Cl. 200-144.00R.
Sipra Patententiwcklungs-und Beteiligungs-Gesellschaft: *See*—
Plath, Ernst-Dieter, 4,612,784, Cl. 66-9.00R.
Sirrenberg, Wilhelm; Marhold, Albrecht; and Becker, Benedikt, to Bayer Aktiengesellschaft. Benzoylureas. 4,613,612, Cl. 514-456.000.
Siuta-Mangano, Patricia; and Dahod, Samun K., to Stauffer Chemical Company. Racemization of optically active compounds having a chlorine substituted chiral carbon atom. 4,613,689, Cl. 562-401.000.
Sivilotti, Olivo G.; and Iseki, Junkichi, to Alcan International Limited. Method for magnesium production. 4,613,414, Cl. 204-70.000.
Skaria, Arankathu; Stark, Reiner; and Schenkel, Hans, to Swiss Aluminium Ltd. Method of manufacture of calcined aluminum fluoride. 4,613,493, Cl. 423-489.000.
SKF Steel Engineering, A.B.: *See*—
Hammarskog, Bjorn, 4,613,364, Cl. 75-34.000.
Skovmand, Timothy J., to National Semiconductor Corporation. Quiescent current reduction in low dropout voltage regulators. 4,613,809, Cl. 323-268.000.
Skrzypek, James R. Self energizing emergency brake and anti-side-skid apparatus. 4,613,015, Cl. 188-6.000.
Slee, Roger H., to AE PLC. Machine tools. 4,612,833, Cl. 82-18.000.
Slegeir, William A.: *See*—
Mahajan, Devinder; Slegeir, William A.; Sapienza, Richard S.; and O'Hare, Thomas E., 4,613,623, Cl. 518-700.000.
Sleigh, Thomas; Savage, David S.; and Clark, John K., to AKZO N.V. Anti-arrhythmic amino-alcohols. 4,613,619, Cl. 514-546.000.
Sloan-Kettering Institute for Cancer Research: *See*—
Cote, Richard J.; Morrissey, Donna M.; Houghton, Alan N.; Beattie, Edward J., Jr.; Oettgen, Herbert F.; and Old, Lloyd J., 4,613,576, Cl. 436-548.000.
Sloan Valve Company: *See*—
Lissau, Frederic, deceased; and Stoltenberg, Michael R., 4,612,954, Cl. 137-360.000.
Slocum, Barclay. Method of eliminating canine cauda equina syndrome. 4,612,918, Cl. 128-69.000.
Smith, Arthur R.; and Johnson, Bertram, to Bentley Engineering Company Limited. Dials for circular knitting machines. 4,612,785, Cl. 66-25.000.
Smith, Charles E., to Koal-Kote, Inc. Coal coating method. 4,613,523, Cl. 427-220.000.
Smith, Charles L., to Conversion Systems, Inc. Pozzolanically stabilized compositions having improved permeability coefficients. 4,613,374, Cl. 106-118.000.
Smith, David C.; and Noto, Richard, to United States of America, Army. Routing method in computer aided customization of a two level automated universal array. 4,613,941, Cl. 364-490.000.
Smith, David W.: *See*—
Gammans, Richard E.; Smith, David W.; and Yevich, Joseph P., 4,613,600, Cl. 514-252.000.
Smith, Ian P.; Prandle, David L.; Barker, Reginald C.; and Litherland, Robert M. J., to Avon Industrial Polymers Limited. Method of making branches in hoses. 4,613,168, Cl. 285-150.000.
Smith, James V., Jr., to At&T Technologies, Inc. Methods of and apparatus for coating a lightguide fiber. 4,613,521, Cl. 427-169.000.
Smith, Jerry H.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,613,638, Cl. 524-109.000.
Smith, Keith O.; and Glancy, Jerry L., to Boeing Company, The. Latch signal and cowling structure. 4,613,099, Cl. 244-53.00R.
Smith, Lowell S.: *See*—
Edelstein, William A.; Eisner, David R.; Redington, Rowland W.; and Smith, Lowell S., 4,613,820, Cl. 324-318.000.
Smith, Richard C., to Gas Spring Company, Division of Fichtel & Sachs Industries, Inc. Temperature compensated gas spring. 4,613,115, Cl. 267-64.250.
Smith, Roger, Jr.; Priest, Joseph R.; Langowski, Faustyn C.; and Hebard, Harry D., to Hughes Tool Company. Interference warning device. 4,613,849, Cl. 340-679.000.
Smith, Thomas B.: *See*—
Verber, Carl M.; Smith, Thomas B.; and Dunson, Philip M., 4,613,204, Cl. 350-96.140.
Smits, Jozef A. F.: *See*—
Aliani, Giorgio; Lechat, Jacques B.; and Smits, Jozef A. F., 4,613,632, Cl. 523-172.000.
SMS Schloemann-Siemag AG: *See*—
Grothe, Horst, 4,612,970, Cl. 164-416.000.
Smulders, Henricus C.: *See*—
de Wild, Willem R.; de With, Gijsbertus; and Smulders, Henricus C., 4,612,689, Cl. 29-25.420.
Smyth, Dale C., Jr., to Cincinnati Incorporated. Hydraulically actuated tooling clamps for the ram and bed of a press brake and the like. 4,612,796, Cl. 72-481.000.
Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Rossi, Pier P.; and Marchetti, Salvatore, 4,613,694, Cl. 562-590.000.
Snyder, Robert H., to Uniroyal Tire Company, Inc. Scrap tire cutting apparatus. 4,613,087, Cl. 241-111.000.
S.A. Martin: *See*—
Capdeboscq, Bernard; and Cuzin, Marc, 4,613,268, Cl. 414-114.000.
Societe Anonyme: Synthelabo: *See*—
Dormia, Enrico, 4,612,931, Cl. 128-328.000.
Societe Europeene de Propulsion: *See*—
Lacombe, Alain; and Vives, Michel, 4,613,021, Cl. 188-218.0XL.
Societe Europeenne de Propulsion: *See*—
Maistre, Michel, 4,612,750, Cl. 52-638.000.
Societe Industrielle de Brevets et d'Etudes (S.I.B.E.): *See*—
Bauer, Philippe, 4,613,081, Cl. 239-585.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Castel, Yvon; and Iato, Michel, 4,612,994, Cl. 166-344.000.
Soderholm, Leo H., to United States of America, Agriculture. Output responsive field control for wind-driven alternators and generators. 4,613,762, Cl. 290-44.000.
Solitron Devices, Inc.: *See*—
McGeary, Peter G., 4,613,199, Cl. 339-177.00R.

Solvay & Cie.: *See*—
Franklin, James, 4,613,709, Cl. 570-227.000.
Sony Corporation: *See*—
Chubachi, Ryoji; and Nihei, Nobuyuki, 4,613,545, Cl. 428-328.000.
Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, 4,613,967, Cl. 369-221.000.
Hori, Katsuya; and Furuya, Tsuneo, 4,613,965, Cl. 369-59.000.
Matsunaga, Osamu; and Kobayashi, Hiroyuki, 4,613,900, Cl. 358-123.000.
Ohmori, Shohi, 4,613,902, Cl. 358-124.000.
Shichijo, Hajime; Tsukatani, Masamitsu; and Kato, Takeshi, 4,613,736, Cl. 200-317.000.
Takamori, Tsutomu; Nakamura, Yoshiyuki; and Abe, Hitoshi, 4,613,827, Cl. 331-20.000.
Sophisticated Systems, Inc.: *See*—
Wreath, Clarence F.; and Keller, Robert D., Jr., 4,613,415, Cl. 204-98.000.
Soucille, Michel; Castelnau, Laurent; and Traiteur, Rene M., to Novatome. Steam generator for a nuclear reactor cooled with liquid metal. 4,612,976, Cl. 165-70.000.
Sound Products Company, L.P.: *See*—
Cribbs, Robert W.; and Zanelli, Claudio I., 4,612,809, Cl. 73-626.000.
Sousa, Anthony A., to Union Carbide Corporation. Synergistic insecticidal compositions containing dione esters. 4,613,617, Cl. 514-521.000.
Southwall Technologies, Inc.: *See*—
Hood, Thomas G.; Vincent, Steve M.; and Mellentin, Stephen W., 4,613,530, Cl. 428-34.000.
Spain, David P.: *See*—
Fisher, Ronald T.; Fisher, Paul J.; and Spain, David P., 4,613,984, Cl. 378-185.000.
Spaulding, Richard A.: *See*—
Burkey, Bruce C.; VanHeyningen, Roger S.; Spaulding, Richard A.; and Wolf, Edward L., 4,613,895, Cl. 358-41.000.
Spaunhorst, Vernon: *See*—
Suher, Frank; Dunn, Glen; Spaunhorst, Vernon; and Urani, Angelo, 4,613,195, Cl. 339-31.00R.
Spectra-Physics, Inc.: *See*—
Bettman, Ralph B., 4,613,972, Cl. 372-107.000.
Speedrack, Inc.: *See*—
Konstant, Anthony N.; and Weider, John J., 4,613,270, Cl. 414-276.000.
Spencer, David R.; Goldstein, Amnon; Grey, David; Balchunas, Theodore G.; and Kaplan, Arthur B., to Data Recording Systems, Inc. High resolution laser printer. 4,613,877, Cl. 346-160.000.
Sperry Corporation: *See*—
Currie, Robert J.; Rushforth, Craig K.; and Zscheile, John W., Jr., 4,613,860, Cl. 340-825.570.
Davidson, Dale D.; and Dietz, David A., 4,613,858, Cl. 340-825.500.
Halls, Lawrence M.; and Wynn, Edward J., 4,612,757, Cl. 56-10.200.
Kurth, Richard R.; and Gabel, Robert A., 4,613,978, Cl. 375-99.000.
Spierer, Abraham: *See*—
Kessler, Efrat; Spierer, Abraham; and Blumberg, Shmaryahum, 4,613,587, Cl. 514-19.000.
Spohr, Reimar, to Gesellschaft fur Schwerionenforschung mbH Darmstadt. Solid material having special electrical properties and a method for its preparation. 4,613,351, Cl. 65-22.000.
Spong, Richard V.: *See*—
Loomis, Phillip E.; Paukovits, Edward J., Jr.; Schuppert, Leo V., Jr.; and Spong, Richard V., 4,612,700, Cl. 29-564.600.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, to International Flavors & Fragrances Inc. Isomer-directed process for producing asymmetric ketones using catalytic Claisen rearrangement of allylic ethers, intermediates, and uses of products and intermediates of process in perfumery. 4,613,706, Cl. 568-322.000.
Springs Industries, Inc.: *See*—
Hendrix, James E.; Daniels, John Y.; and White, Taryn M., 4,613,333, Cl. 8-115.700.
Stacey, Eric J.: *See*—
Cibulka, Frank; and Stacey, Eric J., 4,613,932, Cl. 363-54.000.
Stadler, Karl-Heinz; and Kochloefl, Karel, to Sud-Chemie Aktiengesellschaft. Catalyst and process for the selective hydrogenation of multi-unsaturated organic compounds. 4,613,714, Cl. 585-271.000.
Staffin, H. Kenneth; and Roaper, R. B., to Procedyne Corp. Method and apparatus for pyrolysis of atactic polypropylene. 4,613,713, Cl. 585-241.000.
Stahlecker, Fritz, to Hans Stahlecker and Fritz Stahlecker. Cleaning arrangement for open-end friction spinning machines. 4,612,762, Cl. 57-301.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Pressurized air cleaning arrangement for an open-end friction spinning machine. 4,612,763, Cl. 57-301.000.
Stahlecker, Fritz: *See*—
Stahlecker, Hans; and Stahlecker, Fritz, 4,612,764, Cl. 57-401.000.
Stahlecker, Hans; and Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Conditioning arrangement for open-end friction spinning machine. 4,612,764, Cl. 57-401.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,612,763, Cl. 57-301.000.
Stainless Steel Fabricating, Inc.: *See*—
Rose, Scott J.; Huettner, Rodney J.; and Hall, George H., 4,613,294, Cl. 425-438.000.
Stamberg, Jiri : *See*—
Turkova, Jaroslava; and Stamberg, Jiri , 4,613,502, Cl. 424-94.000.
Stamvik, Anders R.: *See*—
Carlsson, Jan-Inge L.; Jensen Petersen, Herta G.; and Stamvik, Anders R., 4,613,695, Cl. 564-33.000.
Standard Oil Company, The: *See*—
Pedersen, S. Erik; Shaw, Wilfrid G.; and Pfingsten, Linda L., 4,613,711, Cl. 585-411.000.
Standard Oil Company (Indiana): *See*—
Kouba, Jay K.; and Zletz, Alex, 4,613,707, Cl. 568-864.000.
Standard Telephones and Cables Public Limited Company: *See*—
Wong, Andrew C. C.; Fearnhead, Graham R.; and Gale, Simon J., 4,613,977, Cl. 375-97.000.
Stanley Electric Co., Ltd.: *See*—
Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, 4,613,791, Cl. 315-82.000.
Stansfield, Peter W., to Crosfield Electronics (USA) Limited. Reproduction of colored images. 4,613,897, Cl. 358-80.000.
Stapleton, Bruce E. Self-loading dump truck. 4,613,274, Cl. 414-473.000.
Stark, James C.: *See*—
Sandman, Daniel J.; Stark, James C.; and Acampora, Lewis A., 4,613,468, Cl. 260-550.000.
Stark, Reiner: *See*—
Skaria, Arankathu; Stark, Reiner; and Schenkel, Hans, 4,613,493, Cl. 423-489.000.
Statnick, Robert M.: *See*—
Yoon, Heeyoung; and Statnick, Robert M., 4,613,487, Cl. 423-244.000.
Statz, Robert J.: *See*—
Loomis, Gary L.; and Statz, Robert J., 4,613,533, Cl. 428-36.000.
Stauffer Chemical Company: *See*—
Carter, Charles G.; and Lee, David L., 4,613,357, Cl. 71-94.000.
Dahod, Samun K., 4,613,690, Cl. 562-401.000.
Hyzak, Daniel L.; and Gray, Reed A., 4,613,358, Cl. 71-100.000.
Mirviss, Stanley B., 4,613,677, Cl. 560-61.000.
Mirviss, Stanley B.; and Empie, Mark W., 4,613,691, Cl. 562-443.000.
Pallos, Ferenc M., 4,613,356, Cl. 71-94.000.
Parry, Robert W.; Baumann, John A.; and Schachter, Rozalie, 4,613,485, Cl. 422-173.000.
Siuta-Mangano, Patricia; and Dahod, Samun K., 4,613,689, Cl. 562-401.000.
Stebbins, Leslie F.: *See*—
Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., 4,613,379, Cl. 134-7.000.
Steel Castings Research and Trade Association: *See*—
Ashton, Michael C.; Bish, Derek A.; and Sharman, Stephen G., 4,612,968, Cl. 164-34.000.
Steele, Douglas S., to General Electric Company. Ionization detector. 4,613,313, Cl. 445-28.000.
Steele, Douglas S., to General Electric Company. Ionization detector. 4,613,314, Cl. 445-28.000.
Steffan, Walter J.: *See*—
Granum, Michael J.; and Steffan, Walter J., 4,613,086, Cl. 241-101.00B.
Steiger, Anton; and Hofer, Robert, to Sulzer Brothers Limited. Cylinder head for a piston internal combustion engine. 4,612,898, Cl. 123-299.000.
Steinmann, Peter: *See*—
Brugger, Rudolf; Jonke, Gerhard; and Steinmann, Peter, 4,613,214, Cl. 350-511.000.
Stempel, Gunter: *See*—
Held, Manfred; Leidig, Alfred; Merl, Wilhelm A.; and Stempel, Gunter, 4,613,370, Cl. 75-248.000.
Stephan, Donald C.: *See*—
Sharp, Timothy M.; and Stephan, Donald C., 4,613,146, Cl. 280-281.00B.
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., to ICI Americas Inc. Hindered phenolic compounds derived from hexides and stabilized compositions. 4,613,638, Cl. 524-109.000.
Sternberg, Ben K.; and Nopper, Richard W., Jr., to Conoco Inc. Method and apparatus for obtaining high accuracy simultaneous calibration of signal measuring systems. 4,613,821, Cl. 324-323.000.
Stevia Company, Inc.: *See*—
Dobberstein, Robert H.; and Suzuki, Fred K., 4,612,942, Cl. 131-276.000.
Stewart Systems, Inc.: *See*—
Park, David B.; Weaver, John A.; and Zumbrum, A. Scott, 4,613,037, Cl. 198-778.000.
Stoltenberg, Michael R.: *See*—
Lissau, Frederic, deceased; and Stoltenberg, Michael R., 4,612,954, Cl. 137-360.000.
Stoltz, Richard A.: *See*—
Kwon, Young J.; and Stoltz, Richard A., 4,613,366, Cl. 75-84.500.
Stone, Jack C. Side panel assembly. 4,613,182, Cl. 296-181.000.
Stonier, Roger A., to Ford Aerospace & Communications Corporation. Spacecraft antenna reflector. 4,613,870, Cl. 343-915.000.
Strahan, James V.: *See*—
Ajioka, James S.; and Strahan, James V., 4,613,869, Cl. 343-768.000.
Streit, Jill D.: *See*—
Relenyi, Attila G.; Wallick, David E.; and Streit, Jill D., 4,613,671, Cl. 549-274.000.

Strong, James R., to Celanese Corporation. Recovery of rhodium from hydroformylation reaction product. 4,613,701, Cl. 568-454.000.

Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., to Alcon Laboratories, Inc. Cleaning agent for optical surfaces. 4,613,379, Cl. 134-7.000.

Sud-Chemie Aktiengesellschaft: *See*—
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,613,584, Cl. 502-304.000.
Stadler, Karl-Heinz; and Kochloefl, Karel, 4,613,714, Cl. 585-271.000.

Suga, Shigeru. Method and apparatus for measuring gloss which correlates well with visually estimated gloss. 4,613,235, Cl. 356-446.000.

Sugawara, Shinichi: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.

Sugimura, Yukio: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.

Sugioka, Takami, to Teijin Seiki Company Limited. Yarn winding apparatus of automatic bobbin changing type. 4,613,090, Cl. 242-18.00A.

Sugita, Ryuji: *See*—
Kanai, Kenji; Sasaki, Seishi; Takahashi, Ken; and Sugita, Ryuji, 4,613,918, Cl. 360-113.000.

Sugiura, Noboru: *See*—
Abe, Osamu; and Sugiura, Noboru, 4,612,902, Cl. 123-425.000.

Sugiura, Takayuki; and Hasegawa, Takahisa, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Idle control method for an internal combustion engine. 4,612,889, Cl. 123-339.000.

Sugiura, Toshiro; Morita, Toshiki; and Takenaka, Koichi, to Brother Kogyo Kabushiki Kaisha. Printer with mounting structure for print head. 4,613,246, Cl. 400-320.000.

Sugiyama, Hiroyuki: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Suher, Frank; Dunn, Glen; Spaunhorst, Vernon; and Urani, Angelo, to Cooper Industries, Inc. Cartridge fuse terminal adapter. 4,613,195, Cl. 339-31.00R.

Sulzer Brothers Limited: *See*—
Steiger, Anton; and Hofer, Robert, 4,612,898, Cl. 123-299.000.

Sumi, Kiyoshi: *See*—
Nakamura, Shunichi; Okamura, Kenji; Kaneko, Shingo; and Sumi, Kiyoshi, 4,613,643, Cl. 524-426.000.

Sumi, Yasuaki, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Motor velocity control circuit. 4,613,799, Cl. 318-314.000.

Sumitomo Chemical Company, Limited: *See*—
Suzuka, Masakazu; Ohashi, Hiromu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,613,947, Cl. 364-526.000.

Sumitomo Electric Industrial Co., Ltd.: *See*—
Tatsumi, Masayoshi; and Kotani, Toshihiro, 4,613,486, Cl. 422-310.000.

Sun Refining and Marketing Company: *See*—
Hsu, Chao-Yang; and Ellis, Paul E., Jr., 4,613,411, Cl. 203-67.000.

Sunada, Takuya, to Casio Computer Co., Ltd. Waveform data generating system. 4,612,839, Cl. 84-1.010.

Sunbeam Plastics Corporation: *See*—
Wright, David M., 4,613,063, Cl. 222-153.000.

Sundstrand Corporation: *See*—
Sidransky, Fred S., 4,613,291, Cl. 418-15.000.
Sutrina, Thomas; and Readman, John, 4,613,892, Cl. 357-75.000.

Sundstrom, Fred; and Sundstrom, Kent. Appliance for hanging objects on walls. 4,613,108, Cl. 248-497.000.

Sundstrom, Kent: *See*—
Sundstrom, Fred; and Sundstrom, Kent, 4,613,108, Cl. 248-497.000.

Sussenbeck, Heinrich: *See*—
Zitz, Alfred; Lerchbaum, Karl; Toferer, Werner; and Sussenbeck, Heinrich, 4,613,256, Cl. 405-299.000.

Sutrina, Thomas; and Readman, John, to Sundstrand Corporation. Laminated semiconductor assembly. 4,613,892, Cl. 357-75.000.

Sutton, Richard W.: *See*—
Herlin, Robert M.; and Sutton, Richard W., 4,613,391, Cl. 156-213.000.

Suyama, Tadakazu: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.

Suzuka, Masakazu; Ohashi, Hiromu; Murata, Yukio; and Fujitsuka, Nobuyoshi, to Sumitomo Chemical Company, Limited. Method of measuring color difference of dyestuffs. 4,613,947, Cl. 364-526.000.

Suzuki, Atsushi: *See*—
Satoh, Yoshihisa; Akiyoma, Susumu; Ito, Katsunori; Ina, Katsuhiro; Kinugawa, Masumi; and Suzuki, Atsushi, 4,612,894, Cl. 123-494.000.

Suzuki, Fred K.: *See*—
Dobberstein, Robert H.; and Suzuki, Fred K., 4,612,942, Cl. 131-276.000.

Suzuki, Fujio: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Suzuki, Hirofumi; Yoshida, Hitoshi; and Yamaguchi, Shunzo, to Nippondenso Co., Ltd. Ceramic heater and a method for its production. 4,613,455, Cl. 252-516.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Sugiura, Takayuki; and Hasegawa, Takahisa, 4,612,889, Cl. 123-339.000.

Suzuki, Katsuyuki: *See*—
Yamazaki, Toshihiko; Murase, Shoji; Suzuki, Katsuyuki; and Iwatsuki, Makoto, 4,613,359, Cl. 71-122.000.

Suzuki, Koji; and Kawatsura, Yoshihiro, to Canon Kabushiki Kaisha. Surface potentiometer. 4,613,228, Cl. 355-14.00R.

Suzuki, Motoyuki: *See*—
Hosogoe, Junichi; Ida, Yuichi; and Suzuki, Motoyuki, 4,613,853, Cl. 340-710.000.

Suzuki, Takashi; Kawakami, Takamasa; Nakano, Rieko; Koyama, Takeshi; Izaki, Kansei; Mori, Akira; and Orisaku, Masami, to Mitsubishi Gas Chemical Company, Inc. Process for preparing silicon nitride, silicon carbide or fine powdery mixture thereof. 4,613,490, Cl. 423-344.000.

Suzuki, Takeshi: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.

Suzuki, Tomonori; and Toyohara, Makoto, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor. 4,613,310, Cl. 440-76.000.

Suzuki, Yoshiki; Sekine, Kunio; Nagai, Tsuneji; Nambu, Naoki; and Nishimoto, Yuji, to Teijin Limited. Powdery pharmaceutical composition for nasal administration. 4,613,500, Cl. 429-85.000.

Suzuki, Yukio: *See*—
Saito, Ikuo; Minakata, Ryosuke; and Suzuki, Yukio, 4,613,044, Cl. 206-444.000.

Suzumura, Masanaga: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,613,154, Cl. 280-707.000.

Svanholm Engineering AB: *See*—
Svanholm, Gote, 4,613,472, Cl. 264-42.000.

Svanholm, Gote, to Svanholm Engineering AB. Process for the manufacture of aerated concrete products. 4,613,472, Cl. 264-42.000.

Swain, Reginald D., to Thorn EMI Limited. Lamps filament supports for tungsten halogen incandescent. 4,613,787, Cl. 313-579.000.

Swan, George A.; Baird, William C., Jr.; and Corry, Robert G., to Exxon Research and Engineering Co. Catalytic reforming process. 4,613,423, Cl. 208-65.000.

Swansen, Theodore L. Wind driven electric power generating system. 4,613,763, Cl. 290-44.000.

Swart, Daniel J., to Dow Chemical Company, The. Esterification of aromatic dicarboxylic acids with cyclic alkylene carbonates. 4,613,678, Cl. 560-92.000.

Swartz, Gregory L.: *See*—
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,613,503, Cl. 424-117.000.

Swartzbaugh, Peter T. Child-resistant package. 4,613,051, Cl. 215-225.000.

Sweco, Incorporated: *See*—
Racine, Bill A.; Hixson, Marvin D.; and Huber, Gene A., 4,613,432, Cl. 209-254.000.

Swedo, Raymond J.: *See*—
Zupancic, Joseph J.; and Swedo, Raymond J., 4,613,440, Cl. 210-490.000.

Swenson, Ronald R., to Eaton-Kenway, Inc. Floor position sensing apparatus and method. 4,613,804, Cl. 318-587.000.

Swerdon, Paul M. Inflatable insulated barrel cooler. 4,612,781, Cl. 62-457.000.

Swiss Aluminium Ltd.: *See*—
Forster, Ludwig; Franke, Alois; and Nobel, Reinhard, 4,613,375, Cl. 106-281.00R.
Skaria, Arankathu; Stark, Reiner; and Schenkel, Hans, 4,613,493, Cl. 423-489.000.
Zehnder, Jurg, 4,612,862, Cl. 105-340.000.

Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,613,360, Cl. 71-124.000.

Symonds, Denzil J. W.: *See*—
Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., 4,613,030, Cl. 192-106.200.

Syntechnics, Inc.: *See*—
Berg, Robin L.; Morrissette, Douglas; and Ecker, Walter, 4,613,174, Cl. 292-136.000.

Syntex (U.S.A.) Inc.: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,613,606, Cl. 514-307.000.

Szal, Andrzej: *See*—
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,790, Cl. 72-96.000.
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,791, Cl. 72-98.000.

Szarka, David D.: *See*—
Harris, Allen E.; and Szarka, David D., 4,613,159, Cl. 285-3.000.

Sze, Simon M.: *See*—
Ng, Kwok K.; and Sze, Simon M., 4,613,891, Cl. 357-68.000.

Szigeti nee Kiss, Ilona: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.

Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, to Borsodi Vegyi Kombinat. Dithiocarbamate plant fungicides. 4,613,615, Cl. 514-478.000.

Szilagyi, Gyula: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.

Szita, Istvan: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.

Szwarc, Joseph M., to Becton, Dickinson and Company. Two-component medication syringe assembly. 4,613,326, Cl. 604-89.000.

Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Materials which exhibit a surface active effect with vacuum baked photoresists and method of using the same. 4,613,404, Cl. 156-643.000.

Tabor, William J.: *See*—
Sherwood, Richard C.; Tabor, William J.; Vogel, Eva M.; and Zappulla, Robert, 4,613,955, Cl. 365-27.000.

Tachikawa Spring Co., Ltd.: *See*—
Takao, Sakamoto, 4,612,871, Cl. 116-202.000.

Tada, Hiroichi: *See*—
Takita, Nobuhiro; Shimamoto, Yosuke; Tada, Hiroichi; and Tamura, Yutaka, 4,613,896, Cl. 358-76.000.

Tadokoro, Tomoo; Matsuda, Ikuo; and Okimoto, Haruo, to Mazda Motor Corporation. Turbocharged engine with exhaust purifier. 4,612,770, Cl. 60-602.000.

Tadokoro, Tomoo; and Okimoto, Haruo, to Mazda Motor Corporation. Fuel injection system for internal combustion engines. 4,612,904, Cl. 123-492.000.

Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, to Mitsubishi Mining & Cement Co., Ltd. Fiber glass mainly composed of calcium phosphate. 4,613,577, Cl. 501-35.000.

Taira, Shigeo: *See*—
Ishibashi, Toru; and Taira, Shigeo, 4,612,893, Cl. 123-447.000.

Takabe, Ryoji: *See*—
Saito, Sadayuki; Hamada, Shunji; Iwamura, Tadaaki; and Takabe, Ryoji, 4,613,113, Cl. 266-83.000.

Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,613,564, Cl. 430-549.000.

Takada, Shun; Kadowaki, Takashi; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,613,565, Cl. 430-549.000.

Takada, Yuji: *See*—
Fukaya, Hiroshi; Takada, Yuji; and Tamachi, Masao, 4,612,829, Cl. 74-876.000.

Takahara, Yoshimasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.

Takahashi, Ken: *See*—
Kanai, Kenji; Sasaki, Seishi; Takahashi, Ken; and Sugita, Ryuji, 4,613,918, Cl. 360-113.000.

Takahashi, Kensaku: *See*—
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.

Takahashi, Minoru: *See*—
Oyachi, Tomio; Takahashi, Minoru; Izuhara, Koichi; Akiyama, Setsuo; and Yoshikawa, Masato, 4,613,403, Cl. 156-643.000.

Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, to Victor Company of Japan, Ltd. Digital video signal reproducing apparatus. 4,613,908, Cl. 358-310.000.

Takahashi, Takashi: *See*—
Kobori, Yasunori; Nishijima, Hideo; Okamoto, Kaneyuki; Fukushima, Isao; Goto, Katsuhiko; and Takahashi, Takashi, 4,613,914, Cl. 360-70.000.

Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, to Hitachi, Ltd. Apparatus for looping belt-like materials. 4,613,093, Cl. 242-55.000.

Takamori, Tsutomu; Nakamura, Yoshiyuki; and Abe, Hitoshi, to Sony Corporation. Write clock pulse generator used for a time base corrector. 4,613,827, Cl. 331-20.000.

Takamoto, Shigehito; Shoji, Kazunori; Meguri, Nobuyasu; Ohtani, Yoshinori; Kikkawa, Hirofumi; Nishimura, Yasuyuki; Kaku, Hiroyuki; and Murata, Masayasu, to Babcock-Hitachi Kabushiki Kaisha. Process for producing a coal-water slurry. 4,613,084, Cl. 241-16.000.

Takao, Sakamoto, to Tachikawa Spring Co., Ltd. Device for visually setting the spring force of a seat suspension for a vehicle. 4,612,871, Cl. 116-202.000.

Takara Co., Ltd.: *See*—
Kataoka, Isamu, 4,613,315, Cl. 446-355.000.

Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, to Fuji Photo Film Co., Ltd. Developing apparatus. 4,613,221, Cl. 354-321.000.

Takase, Haruo; Hanai, Yoshimitsu; and Otomo, Ryuzi, to Fuji Photo Film Co., Ltd. Film accumulating device for developing apparatus. 4,613,222, Cl. 354-321.000.

Takashima, Seiichi: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Takashima, Yuji: *See*—
Yamamoto, Hajime; Matsuda, Hiromu; Yubakami, Keiichi; and Takashima, Yuji, 4,613,555, Cl. 430-45.000.

Takauji, Kiyomi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,612,838, Cl. 84-1.010.

Takeda Chemical Industries, Inc.: *See*—
Nakayama, Takeo; Fujinami, Kimiya; Sakamoto, Takurou; and Doura, Fumihiro, 4,613,652, Cl. 525-276.000.

Takeda, Shigefumi: *See*—
Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,613,591, Cl. 514-34.000.

Takenaka, Koichi: *See*—
Sugiura, Toshiro; Morita, Toshiki; and Takenaka, Koichi, 4,613,246, Cl. 400-320.000.

Takeo, Shimuzu: *See*—
Seiji, Shibuya; Tuguo, Satoh; Wataru, Komatsu; and Takeo, Shimuzu, 4,613,205, Cl. 350-96.250.

Takeuchi, Hiroyasu: *See*—
Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, 4,613,577, Cl. 501-35.000.

Takeuchi, Makoto: *See*—
Uesugi, Akio; Kakei, Tsutomu; and Takeuchi, Makoto, 4,613,413, Cl. 204-33.000.

Takeuchi, Masaru: *See*—
Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, 4,613,880, Cl. 357-2.000.

Takimoto, Koichi: *See*—
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, 4,613,608, Cl. 514-357.000.

Takita, Nobuhiro; Shimamoto, Yosuke; Tada, Hiroichi; and Tamura, Yutaka, to Dainippon Screen Mfg. Co., Ltd. Methods and apparatus for avoiding moire in color scanners for graphic art. 4,613,896, Cl. 358-76.000.

Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, to Nikki-Universal Co., Ltd. Process of preparing alumina for use in catalyst carrier. 4,613,585, Cl. 502-355.000.

Talley, Lloyd A., to Eubanks Engineering Co. Robot apparatus for handling wire workpiece during termination. 4,612,696, Cl. 29-564.400.

Tam, Simon W.; Reade, Ronald P.; Wong, Jerry Y. K.; and Wang, David N., to Applied Materials, Inc. In-situ photoresist capping process for plasma etching. 4,613,400, Cl. 156-643.000.

Tamachi, Masao: *See*—
Fukaya, Hiroshi; Takada, Yuji; and Tamachi, Masao, 4,612,829, Cl. 74-876.000.

Tamada, Masuo: *See*—
Matsuo, Yukito; Tamada, Masuo; Sawafuji, Takashi; and Azukizawa, Teruo, 4,613,805, Cl. 318-687.000.

Tamukai, Tadao, to Alps Electric Co., Ltd. Printer with supply voltage control circuit. 4,613,873, Cl. 346-33.00R.

Tamura, Yoshio: *See*—
Ikeda, Yoshiaki; Tamura, Yoshio; Nanri, Masahiko; and Onizuka, Yasuki, 4,613,245, Cl. 400-313.000.

Tamura, Yutaka: *See*—
Takita, Nobuhiro; Shimamoto, Yosuke; Tada, Hiroichi; and Tamura, Yutaka, 4,613,896, Cl. 358-76.000.

Tanabe, Tohru: *See*—
Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, 4,613,791, Cl. 315-82.000.

Tanaka, Haruo: *See*—
Omura, Satoshi; Tanaka, Haruo; Hinotozawa, Kiyoizumi; Murata, Masatsune; and Iwai, Yuzuru, 4,613,355, Cl. 71-86.000.

Tanaka, Hiroaki; and Motoori, Ryuzo, to Nippon Kogaku K.K. Picture combining apparatus. 4,613,906, Cl. 358-183.000.

Tanaka, Ichiro: *See*—
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,612,946, Cl. 134-62.000.

Tanaka, Kenichi, to Kakuichi Technical Development Service Kabushiki Kaisha. Process for the manufacture of flexible tubes. 4,613,389, Cl. 156-143.000.

Tanaka, Koji: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Tanaka, Shun-ichiro, to Kabushiki Kaisha Toshiba. Bonded metal-ceramics composite. 4,613,549, Cl. 428-469.000.

Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,613,154, Cl. 280-707.000.

Tanaka, Teruo: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Hashimoto, Toshihiko; Tanaka, Teruo; Iino, Kimio; Shibata, Tomoyuki; and Sugawara, Shinichi, 4,613,595, Cl. 514-195.000.
Tanaka, Toshinori; and Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Multi-function starter device. 4,613,007, Cl. 180-89.150.
Tang, Robert H., to PPG Industries, Inc. Method for polymerizing bis(allyl carbonate) resin. 4,613,656, Cl. 526-193.000.
Taniguchi, Yasutaka: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,613,154, Cl. 280-707.000.
Taniyama, Kiyoshi: *See*—
Hori, Hiroshi; Taniyama, Kiyoshi; and Huruhata, Katumi, 4,612,818, Cl. 74-467.000.
Tao, Muneo: *See*—
Harada, Toyohei; and Tao, Muneo, 4,613,298, Cl. 431-88.000.
Tap-Rite Products Corp.: *See*—
Hines, James H., 4,613,851, Cl. 340-688.000.
Tappan Company, The: *See*—
Peterson, Donald E., 4,613,192, Cl. 339-14.00P.
Tar, Csaba: *See*—
Szilagyi, Gyula; Tar, Csaba; Bendly, Mariann; Dienes nee, Erzsebet, Mezo; Boda, Gabor; and Csutak, Janos, 4,613,615, Cl. 514-478.000.
Tate, Michael J., to Avco Corporation. Passively modulated cooling of turbine shroud. 4,613,280, Cl. 415-17.000.
Tate, Susumu; Hashimoto, Hiroshi; and Chiba, Akira, to Toyo Boseki Kabushiki Kaisha. Process for production of polyester. 4,613,664, Cl. 528-274.000.
Tatemoto, Minoru: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,613,154, Cl. 280-707.000.
Tatom, Mabry, Jr. Trolling motor foot control with arc suppressor. 4,613,801, Cl. 318-440.000.
Tatsumi, Masayoshi; and Kotani, Toshihiro, to Sumitomo Electric Industrial Co., Ltd. Semiconductor boule pulling rod. 4,613,486, Cl. 422-310.000.
Tatsushima, Masaru: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,613,585, Cl. 502-355.000.
Taub, Alan I.: *See*—
Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., 4,613,368, Cl. 75-246.000.
Chang, Keh-Minn; Huang, Shyh-Chin; and Taub, Alan I., 4,613,480, Cl. 419-30.000.
Taylor, Bobby C.; and Olsen, Peter C., Jr., to Manville Service Corporation. Method and apparatus for locking a carrier. 4,612,753, Cl. 53-398.000.
Teale, James M.: *See*—
Bachrach, Frank; and Teale, James M., 4,612,944, Cl. 132-11.00R.
Technische Gerate-u. Entwicklungsgesellschaft m.b.H: *See*—
Jordan, Heinz, 4,613,097, Cl. 244-12.400.
Tegrarian, Haig V.; and Ciftan, Mikael. Apparatus for infusing blood and other related fluids into a patient's body. 4,613,327, Cl. 604-141.000.
Teijin Limited: *See*—
Suzuki, Yoshiki; Sekine, Kunio; Nagai, Tsuneji; Nambu, Naoki; and Nishimoto, Yuji, 4,613,500, Cl. 429-85.000.
Teijin Seiki Company Limited: *See*—
Sugioka, Takami, 4,613,090, Cl. 242-18.00A.
Tektronix, Inc.: *See*—
Knierim, Daniel G.; and Jalovec, Lee J., 4,613,950, Cl. 364-569.000.
Le, Hue P.; Jaeger, Charles W.; and Oswald, James C., 4,613,875, Cl. 346-140.00R.
Olin, Daniel C.; Anderson, Russell Y.; and DenBeste, Steven C., 4,613,856, Cl. 340-723.000.
Penney, Bruce J., 4,613,814, Cl. 324-77.00B.
Telefunken Electronic GmbH: *See*—
Angerstein, Jorg; and Silber, Dieter, 4,613,884, Cl. 357-39.000.
Rinderle, Heinz; and Siegle, Martin, 4,613,823, Cl. 330-289.000.
Rinderle, Heinz, 4,613,824, Cl. 330-302.000.
Schairer, Werner, 4,613,890, Cl. 357-67.000.
Teletron Security, Inc.: *See*—
Watkins, Randy W., 4,613,848, Cl. 340-541.000.
Terashima, Masaaki: *See*—
Seshimoto, Osamu; Saito, Yoshio; Koizumi, Teruaki; and Terashima, Masaaki, 4,613,420, Cl. 204-412.000.
Terrell, Jamie B.; and Holmes, Benny J., to Gearhart Industries, Inc. Staged chemical pipe cutter. 4,613,394, Cl. 156-345.000.
Texaco Inc.: *See*—
Choi, Frank H.; Rein, Samuel W.; and Alexander, David L., 4,612,799, Cl. 73-54.000.
McEntire, Edward E.; and Sellstrom, Kathy B., 4,613,673, Cl. 556-100.000.
Texas Instruments Incorporated: *See*—
Haken, Roger A., 4,613,885, Cl. 357-42.000.
Kuo, Chang-Kiang, 4,613,889, Cl. 357-54.000.
Paterson, James L.; and Haken, Roger A., 4,613,956, Cl. 365-185.000.
Thicke, Ricky P.; O'Brien, Stanley B.; Nordyke, David M.; Fox, Dennis L.; Folkert, Thomas E.; and Diemer, Bruce R., to International Business Machines Corporation. Fixed abrasive polishing media. 4,613,345, Cl. 51-293.000.
Thiel, Rudolf: *See*—
Weiler, Rolf; Thiel, Rudolf; Bach, Uwe; and Panek, Peter, 4,613,018, Cl. 188-72.400.
Thoma, Wilhelm: *See*—
Potter, Terry; Thoma, Wilhelm; and Pedain, Josef, 4,613,527, Cl. 427-412.000.
Thomas, Gareth; and Nakagawa, Alvin H., to University of California, Regents of the. High strength, low carbon, dual phase steel rods and wires and process for making same. 4,613,385, Cl. 148-12.00B.
Thomas, Michael; Neumann, Peter; Wegerle, Dieter; and Krallmann, Reinhold, to BASF Aktiengesellschaft. Lightfastness of dyeings obtained with acid dyes or metal complex dyes on polyamides. 4,613,334, Cl. 8-442.000.
Thompson, Christopher G.: *See*—
Manners-Smith, John; Thompson, Christopher G.; and Bailey, John E., 4,612,720, Cl. 40-211.000.
Thompson, Randall, Jr. Tide activated generator. 4,612,768, Cl. 60-506.000.
Thomson Components-Mostek Corportion: *See*—
Jiang, Ching-Lin, 4,613,959, Cl. 365-200.000.
Thomson-CSF: *See*—
Brault, Roland, 4,613,924, Cl. 361-403.000.
Catros, Jean-Yves; Chapuis, Franck; and Malo-Renault, Francois, 4,613,894, Cl. 358-13.000.
Yedid, Henri; and Audoin, Maurice, 4,613,983, Cl. 378-99.000.
Thorn EMI Limited: *See*—
Swain, Reginald D., 4,613,787, Cl. 313-579.000.
Thyssen Industrie Aktiengesellschaft: *See*—
Hausler, Dietrich; and Schwarz, Horst, 4,613,088, Cl. 241-197.000.
Tiebel, Rainer: *See*—
Drechsler, Klaus D.; Heuer, Werner; and Tiebel, Rainer, 4,613,751, Cl. 250-223.00R.
Tiep, Brian L.; Phillips, Robert E.; and Otsap, Ben A. Method and apparatus for supplying a gas to a body. 4,612,928, Cl. 128-204.230.
Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 4,612,876, Cl. 119-5.000.
Tihanyi, Jenoe, to Siemens Aktiengesellschaft. Dynamic semiconductor memory cell and method for its manufacture. 4,613,883, Cl. 357-23.400.
Timmermann, Hartwig, to Medel Mediziniche Elektronik Handelsges. mbH. Circuit arrangement for checking the position of electrodes. 4,613,850, Cl. 340-686.000.
Tinder, David V.: *See*—
Migrin, Robert S.; and Tinder, David V., 4,613,733, Cl. 200-5.00R.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Furuhashi, Hiroyuki; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,613,579, Cl. 502-115.000.
Maruyama, Kouji; Nomura, Takeshi; Ueno, Hiroshi; and Inaba, Naomi, 4,613,581, Cl. 502-127.000.
Tobe, Kazumitsu, to Canon Kabushiki Kaisha. Video signal recording and reproducing system. 4,613,909, Cl. 358-310.000.
Tobin, Gerard J. Method of playing a board game utilizing a board with different zones. 4,613,134, Cl. 273-242.000.
Tobo Made B.V.: *See*—
Scholte, Bob, 4,613,148, Cl. 280-491.00E.
Toferer, Werner: *See*—
Zitz, Alfred; Lerchbaum, Karl; Toferer, Werner; and Sussenbeck, Heinrich, 4,613,256, Cl. 405-299.000.
Tohara, Masahiro: *See*—
Naito, Hiroyuki; and Tohara, Masahiro, 4,613,872, Cl. 346-1.100.
Tohno, Masao: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.
Tohyama, Shunroku: *See*—
Yamashita, Yasuo; Kiyomura, Yoshiteru; and Tohyama, Shunroku, 4,613,529, Cl. 428-15.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Nakamura, Shunichi; Okamura, Kenji; Kaneko, Shingo; and Sumi, Kiyoshi, 4,613,643, Cl. 524-426.000.
Tokyo Gas Company, Ltd.: *See*—
Omori, Toshiaki, 4,613,071, Cl. 237-9.00R.
Tokyo Juki Industrial Co., Ltd.: *See*—
Okabayashi, Mitumasa; and Shiga, Norio, 4,613,244, Cl. 400-175.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Noma, Kouichi; Matsuda, Kazuto; and Sakurai, Toshio, 4,612,777, Cl. 62-247.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iwahashi, Hiroshi, 4,613,957, Cl. 365-189.000.
Iwai, Hiroshi, 4,613,230, Cl. 355-53.000.
Koike, Hideharu, 4,613,773, Cl. 307-443.000.
Maruko, Kinya, 4,613,852, Cl. 340-703.000.
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,612,946, Cl. 134-62.000.
Tokyu Sharyo Seizo Kabushiki Kaisha: *See*—
Kimura, Tetsuro; and Ide, Kohei, 4,613,053, Cl. 220-22.000.
Tomioka, Hidehiro: *See*—
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; Imazu, Keinosuke; and Tomioka, Hidehiro, 4,613,830, Cl. 331-65.000.
Tomozane, Kazuo: *See*—
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.

Toray Industries, Inc.: *See*—
Naruto, Masanobu; Kondo, Hisao; and Hata, Go, 4,613,680, Cl. 560-205.000.
Yamashita, Yasuo; Kiyomura, Yoshiteru; and Tohyama, Shunroku, 4,613,529, Cl. 428-15.000.

Tordella, Joseph R.: *See*—
Sacchetti, John A.; Tordella, Joseph R.; and Pellegrino, Arthur J., 4,613,057, Cl. 221-265.000.

Tornero, Lino E. Mechanical adjustable column. 4,613,106, Cl. 248-405.000.

Toth, Istvan: *See*—
Viski, Peter; Simandi, Laszlo ; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, 4,613,461, Cl. 540-608.000.

Totten, Thomas B. Retrofit louvre for lighting fixture. 4,613,929, Cl. 362-150.000.

Tottori Sanyo Electric Co., Ltd.: *See*—
Sumi, Yasuaki, 4,613,799, Cl. 318-314.000.

Towae, Friedrich: *See*—
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Hellbach, Hans, 4,613,466, Cl. 560-344.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Tate, Susumu; Hashimoto, Hiroshi; and Chiba, Akira, 4,613,664, Cl. 528-274.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, 4,613,666, Cl. 544-277.000.

Toyoda, Shuhei: *See*—
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,612,822, Cl. 74-493.000.

Toyohara, Makoto: *See*—
Suzuki, Tomonori; and Toyohara, Makoto, 4,613,310, Cl. 440-76.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Buma, Shuuichi, 4,613,116, Cl. 267-64.250.
Hori, Hiroshi; Taniyama, Kiyoshi; and Huruhata, Katumi, 4,612,818, Cl. 74-467.000.
Nagasaka, Yasumasa, 4,613,296, Cl. 425-547.000.
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,612,822, Cl. 74-493.000.
Yoshizaki, Kouji, 4,612,887, Cl. 123-198.00F.

Traiteur, Rene M.: *See*—
Soucille, Michel; Castelnau, Laurent; and Traiteur, Rene M., 4,612,976, Cl. 165-70.000.

Trans-World Manufacturing Corp.: *See*—
Lasky, Richard J., 4,613,128, Cl. 272-8.00M.

Trausch, Gunter: *See*—
Kobale, Manfred; Trausch, Gunter; and Wengert, Rolf, 4,613,399, Cl. 156-634.000.

Traut, G. Robert; Keahey, Frank S., Jr.; Kozakoff, Dennis J.; Bethea, Paul M.; and Hensel, Joseph D., to Rogers Corporation. Window for broad bandwidth electromagnetic signal transmission, and method of construction thereof. 4,613,540, Cl. 428-212.000.

Treybig, Duane S., to Dow Chemical Company, The. Thermoplastic and thermosettable products prepared by reacting nitrogen-containing heterocyclic compounds with aromatic aldehydes. 4,613,663, Cl. 528-266.000.

Trimble, Lyne S. Magnetic printing. 4,613,874, Cl. 346-74.600.

Tritec, Inc.: *See*—
Beers, Howard L., 4,613,193, Cl. 339-17.00L.

Troncoso, Vincent F. Compound archery bow assembly. 4,612,906, Cl. 124-24.00R.

Troughton, Gary E.: *See*—
Clarke, Michael R.; and Troughton, Gary E., 4,612,802, Cl. 73-73.000.

Truitt, Gary: *See*—
Baggiolini, Enrico; Pizzolato, Giacomo; Uskokovic, Milan; and Truitt, Gary, 4,613,594, Cl. 514-167.000.

Tsolis, Alexandros K.; and Mikroyannidis, Ioannis A. 2-hydroxy-2-phosphinyl ethanals and 1,2-dihydroxy-1,2-bisphosphinyl ethanes. 4,613,674, Cl. 558-161.000.

Tsubota, Yasumasa: *See*—
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,613,153, Cl. 280-689.000.

Tsuchihashi, Akira: *See*—
Miyake, Norihisa; Tsuchihashi, Akira; Fujiwara, Osamu; Hashimoto, Yasuhiro; and Maruyama, Yutaka, 4,613,943, Cl. 364-513.000.

Tsuchiya, Keiro: *See*—
Ushigoe, Tomio; Kobayashi, Takeo; Yoshinaga, Yoshitsugu; Tsuchiya, Keiro; and Miyagawa, Kazuo, 4,612,832, Cl. 82-3.000.

Tsuchiya, Yoshikazu: *See*—
Kurihara, Norimitsu; Tsuchiya, Yoshikazu; Kikuchi, Akira; Tanabe, Tohru; and Okazaki, Kunio, 4,613,791, Cl. 315-82.000.

Tsuda, Yoshio: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,613,605, Cl. 514-294.000.

Tsuge, Hiroshi; Fujiwara, Akinori; Iwasa, Hiroki; Nagasaka, Chikao; and Muraoka, Tsutomu, to Kabushiki Kaisha Tokai-rika-denki-seisakusho. Child restraining device. 4,613,188, Cl. 297-250.000.

Tsuji, Kenji: *See*—
Yabu, Hisao; Tsuji, Kenji; and Hirabayashi, Akinori, 4,613,840, Cl. 335-128.000.

Tsujimura, Iwao; and Kubo, Katunori, to Yanmar Diesel Engine Co., Ltd. Gas valve driving apparatus of a gas engine. 4,612,881, Cl. 123-27.0GE.

Tsujino, Masatoshi: *See*—
Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, 4,613,666, Cl. 544-277.000.

Tsukatani, Masamitsu: *See*—
Shichijo, Hajime; Tsukatani, Masamitsu; and Kato, Takeshi, 4,613,736, Cl. 200-317.000.

Tsumura Juntendo Inc.: *See*—
Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,613,591, Cl. 514-34.000.

Tsunoda, Hajime: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.

Tuguo, Satoh: *See*—
Seiji, Shibuya; Tuguo, Satoh; Wataru, Komatsu; and Takeo, Shimuzu, 4,613,205, Cl. 350-96.250.

Tuji, Tatuhito: *See*—
Shibayama, Katsujiro; Iwaya, Fukuo; Takahashi, Kensaku; Nukumi, Masumi; Tuji, Tatuhito; Okuma, Michio; and Odawara, Yoji, 4,613,573, Cl. 435-289.000.

Turkova, Jaroslava; and Stamberg, Jiri , to Ceskoslovenska akademie ved. Proteolytic, dry biopolymeric composition for treatment of wounds, and method of using same. 4,613,502, Cl. 424-94.000.

Turley, Stephen E. H., to ITT Industries Inc. Injection laser manufacture. 4,613,387, Cl. 148-171.000.

Twyman, Diana L.: *See*—
Norton, Jane A.; Twyman, Diana L.; Young, A. Byron; and Rapp, Robert, 4,613,323, Cl. 604-43.000.

Uchida, Katsuhiro: *See*—
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.

Uchiyama, Takako: *See*—
Aoyama, Tetsuo; Kida, Koichi; and Uchiyama, Takako, 4,613,684, Cl. 560-179.000.

Ueda, Atsushi: *See*—
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,612,900, Cl. 123-425.000.
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,612,901, Cl. 123-425.000.

Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, to Fujisawa Pharmaceutical Co., Ltd. Mono or dinitroxyalkyl pyridines and vasodilating compositions. 4,613,608, Cl. 514-357.000.

Ueda, Kenji: *See*—
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; Imazu, Keinosuke; and Tomioka, Hidehiro, 4,613,830, Cl. 331-65.000.

Ueda, Tooru: *See*—
Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, 4,613,666, Cl. 544-277.000.

Uenishi, Mitsuaki: *See*—
Miyatake, Norio; Uenishi, Mitsuaki; Kashimura, Nobuo; and Ishiwatari, Keizo, 4,613,919, Cl. 360-118.000.

Ueno, Hiroshi: *See*—
Furuhashi, Hiroyuki; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,613,579, Cl. 502-115.000.
Maruyama, Kouji; Nomura, Takeshi; Ueno, Hiroshi; and Inaba, Naomi, 4,613,581, Cl. 502-127.000.

Uesugi, Akio; Kakei, Tsutomu; and Takeuchi, Makoto, to Fuji Photo Film Co., Ltd. Process for producing aluminum support for lithographic plate. 4,613,413, Cl. 204-33.000.

Ulbrich, Hans-Joachim; and Quester, Horst, to Wilh. Quester Maschinenfabrik GmbH. Pressure-gas operated dispensing means for fluids. 4,613,060, Cl. 222-61.000.

Umeha, Genkichi; Fujita, Yoshiaki; and Shimura, Atsushi, to Nippon Piston Ring Co., Ltd. Method of manufacturing a hollow cam shaft. 4,612,695, Cl. 29-505.000.

Umehara, Hidetoshi: *See*—
Kikuchi, Kunio; and Umehara, Hidetoshi, 4,613,072, Cl. 237-12.30C.

Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, to Hokko Chemical Industry Co., Ltd.; Mitsui Engineering & Shipbuilding Co., Ltd.; and Nippon Paint Co., Ltd. Tetraarylboron-ammonium complexes and their uses. 4,613,373, Cl. 106-18.300.

Underbakke, Timara: *See*—
Sherman, Norman; and Underbakke, Timara, 4,613,627, Cl. 521-68.000.

Underhill, Kim. Patient gown. 4,612,673, Cl. 2-114.000.

Unger, Hans W.: *See*—
Backstein, Guenter; and Unger, Hans W., 4,612,858, Cl. 102-245.000.

Union Carbide Corporation: *See*—
Haack, John L.; and Mohr, Paul H., 4,613,445, Cl. 252-75.000.
Kaiser, Steven W., 4,613,721, Cl. 585-643.000.
Robeson, Lloyd M.; Harris, James E.; and Michno, Michael J., Jr., 4,613,645, Cl. 524-443.000.

Sousa, Anthony A., 4,613,617, Cl. 514-521.000.
Union Chimique et Industrielle de l'Ouest: *See—*
Moran, Francis; Rocher, Sylvain; Cot, Louis; Dabosi, Francis; Duprat, Michel; and Durand, Jean, 4,613,450, Cl. 252-181.000.
Union Oil Company of California: *See—*
Brass, Stephen; Croudace, Michael C.; and Wusz, Timothy, 4,612,880, Cl. 123-1.00A.
Unique Gifts, Inc.: *See—*
Tigert, Donald J., 4,612,876, Cl. 119-5.000.
Uniroyal Tire Company, Inc.: *See—*
Snyder, Robert H., 4,613,087, Cl. 241-111.000.
United Kingdom Atomic Energy Authority: *See—*
McKirdy, Bruce J.; and Cooper, Ashley G., 4,612,808, Cl. 73-622.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Barwood, Anthony J., 4,612,687, Cl. 24-574.000.
United States of America
Agriculture: *See—*
Soderholm, Leo H., 4,613,762, Cl. 290-44.000.
Air Force: *See—*
Lee, Roger K., 4,612,733, Cl. 51-119.000.
O'Donnell, Bernard N., 4,613,862, Cl. 343-17.1PF.
Army: *See—*
Smith, David C.; and Noto, Richard, 4,613,941, Cl. 364-490.000.
Energy: *See—*
Duchane, David V.; and Cash, David L., 4,613,629, Cl. 521-82.000.
Honig, Emanuel M., 4,613,765, Cl. 307-252.00K.
Mahajan, Devinder; Siegeir, William A.; Sapienza, Richard S.; and O'Hare, Thomas E., 4,613,623, Cl. 518-700.000.
Yacobi, Ben G., 4,613,519, Cl. 427-39.000.
Health and Human Services: *See—*
Rice, Kenner C., 4,613,668, Cl. 546-44.000.
Interior: *See—*
Falke, Wilbert L.; Lee, Agnes Y.; and Neumeier, Leander A., 4,613,069, Cl. 228-211.000.
Navy: *See—*
Haun, Michael J.; Newnham, Robert E.; and Schulze, Walter A., 4,613,784, Cl. 310-358.000.
Hudgens, Jeffrey W., 4,613,755, Cl. 250-282.000.
Jablonski, Daniel G.; and Watkins, Richard W., 4,613,810, Cl. 323-271.000.
U.S. Philips Corporation: *See—*
Aarts, Ronaldus M., 4,613,961, Cl. 369-44.000.
Blomqvist, Klas I., 4,613,788, Cl. 315-39.610.
de Wild, Willem R.; de With, Gijsbertus; and Smulders, Henricus C., 4,612,689, Cl. 29-25.420.
Eckel, Merowech, 4,612,731, Cl. 51-56.00R.
Huppe, Reinhard; Kaufer, Helmut; and Lemke, Hans J., 4,613,295, Cl. 425-542.000.
Martens, Gerhard, 4,612,810, Cl. 73-705.000.
Wilson, James B., 4,613,233, Cl. 356-328.000.
U.S. Tech Corporation: *See—*
Gelston, Norbert E., II, 4,613,812, Cl. 324-58.50B.
United Technologies Automotive, Inc.: *See—*
Migrin, Robert S.; and Tinder, David V., 4,613,733, Cl. 200-5.00R.
United Technologies Corporation: *See—*
Layden, George K.; and Prewo, Karl M., 4,613,473, Cl. 264-103.000.
Luczak, Francis J.; and Landsman, Douglas A., 4,613,582, Cl. 502-185.000.
Melton, Lynn A., 4,613,237, Cl. 374-162.000.
Packer, Louis L.; Bosshart, George S.; Jaworowski, Mark R.; and Kuntz, Urban E., 4,613,259, Cl. 406-14.000.
Unitrode Corporation: *See—*
Holland, Varnum S., 4,613,767, Cl. 307-288.000.
Universidad Central de Venezuela: *See—*
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
University of California, Regents of the: *See—*
Thomas, Gareth; and Nakagawa, Alvin H., 4,613,385, Cl. 148-12.00B.
University of Kentucky Research Foundation: *See—*
Norton, Jane A.; Twyman, Diana L.; Young, A. Byron; and Rapp, Robert, 4,613,323, Cl. 604-43.000.
University of Pittsburgh: *See—*
Chiang, Shiao-Hung; and Klinzing, George E., 4,613,429, Cl. 209-5.000.
University of Southern California: *See—*
Iwanczyk, Jan S.; Barton, Jeff B.; Dabrowski, Andrzej J.; and Schnepple, Wayne F., 4,613,756, Cl. 250-361.00R.
University of Southern Mississippi: *See—*
Mathias, Lon J.; and Hermes, Robert E., 4,613,658, Cl. 526-312.000.
University of Utah: *See—*
Jacobsen, Stephen C.; Wright, Harlan R., deceased; and Pendell, Gail J., general personal representative, 4,613,331, Cl. 623-61.000.
Uno, Jyoji: *See—*
Miyoshi, Tatuo; Uno, Jyoji; and Iwamatsu, Kouji, 4,613,301, Cl. 431-259.000.
Unsold, Eberhard: *See—*
Dietrich, Ralph; Jocham, Dieter; Unsold, Eberhard; Weinsheimer, Wolfram; and Gorisch, Wolfram, 4,612,938, Cl. 128-665.000.
UOP Inc.: *See—*
Frame, Robert R., 4,613,580, Cl. 502-117.000.
Upjohn Company, The: *See—*
Sacks, Clifford E., 4,613,463, Cl. 540-94.000.
Urabe, Suehiro; and Iwasa, Yoshio, to Nissan Motor Co., Ltd. Induction system for internal combustion engine having multiple inlet valves. 4,612,903, Cl. 123-432.000.
Urani, Angelo: *See—*
Suher, Frank; Dunn, Glen; Spaunhorst, Vernon; and Urani, Angelo, 4,613,195, Cl. 339-31.00R.
Uranium Pechiney: *See—*
Lamerant, Jean-Michel; Pallez, Francois; and Personnet, Pierre-Bernard, 4,613,361, Cl. 75-2.000.
Urch, John F. Twin reservoir heat transfer circuit. 4,612,782, Cl. 62-500.000.
Usala, Hugo R., to Du Pont de Nemours, E. I., and Company. Castable ceramic compositions. 4,613,648, Cl. 524-555.000.
USG Acoustical Products Company: *See—*
Sherman, Norman; and Underbakke, Timara, 4,613,627, Cl. 521-68.000.
Ushigoe, Tomio; Kobayashi, Takeo; Yoshinaga, Yoshitsugu; Tsuchiya, Keiro; and Miyagawa, Kazuo, to Kabushiki Kaisha Miyano Tekkosho. Multiple-function machine tool with two spindles. 4,612,832, Cl. 82-3.000.
Uskokovic, Milan: *See—*
Baggiolini, Enrico; Pizzolato, Giacomo; Uskokovic, Milan; and Truitt, Gary, 4,613,594, Cl. 514-167.000.
Utah Power & Light: *See—*
Oliver, Derald, 4,613,302, Cl. 431-263.000.
Utsugi, Mikio, to Fuji Photo Film Co., Ltd. Still picture to television signal conversion system. 4,613,910, Cl. 358-310.000.
Vaerewyck, Eugene G.; Chen, Cheng-Lin; and Asars, Juris A., to Westinghouse Electric Corp. Faraday current sensor with fiber optic compensated by temperature, degradation, and linearity. 4,613,811, Cl. 324-96.000.
Valeo: *See—*
Beccaris, Carlo, 4,613,029, Cl. 192-106.200.
Bouvot, Jean-Francois; and LeBorgne, Jose , 4,612,847, Cl. 92-13.100.
Despres, Dominique, 4,613,025, Cl. 192-70.180.
Lassiaz, Philippe; and Mallet, Bernard, 4,613,027, Cl. 192-89.00B.
Renaud, Pierre; and Lassaiz, Philippe, 4,613,028, Cl. 192-98.000.
Vali, Enn, to Westinghouse Canada Inc. Pattern tracer using matrix sensor. 4,613,749, Cl. 250-202.000.
Van Dyk & Company Inc.: *See—*
Conner, Donald E., 4,613,499, Cl. 424-59.000.
van der Lely, Cornelis. Vehicle king pin and drive assembly. 4,613,011, Cl. 180-261.000.
Van Erp, Willibrord A.; Seelen-Kruijssen, Josepha M. E.; and Huizinga, Tom, to Shell Oil Company. Process for the preparation of crystalline aluminum silicate compounds using pyridine and a quaternary ammonium compound. 4,613,488, Cl. 423-328.000.
VanHeyningen, Roger S.: *See—*
Burkey, Bruce C.; VanHeyningen, Roger S.; Spaulding, Richard A.; and Wolf, Edward L., 4,613,895, Cl. 358-41.000.
Vann, Roy R.; and Brieger, Emmet F., to Halliburton Company. Single trip completion of spaced formations. 4,612,992, Cl. 166-297.000.
Van Patten, Frederic D. Viewing instrument for chimney. 4,612,908, Cl. 126-200.000.
VanWert, Bernard: *See—*
Blizzard, John D.; and VanWert, Bernard, 4,613,534, Cl. 428-57.000.
van Zelm, Willem D. Hand-held gripping device with improved support for handicapped persons having limited finger function or wrist strength. 4,613,179, Cl. 294-19.100.
Varaprasad, D. V. P. R.: *See—*
Winston, Anthony; and Varaprasad, D. V. P. R., 4,613,616, Cl. 514-507.000.
Varian Associates, Inc.: *See—*
Siddall, Graham J.; Eaton, Steven G.; Kruger, James B.; Garrettson, Garrett A.; and Neukermans, Armand P., 4,613,981, Cl. 378-34.000.
Vasilos, Thomas, to Avco Corporation. Oxidation resistant carbon-carbon composites. 4,613,522, Cl. 427-202.000.
Verber, Carl M.; Smith, Thomas B.; and Dunson, Philip M., to Battelle Memorial Institute. D/A conversion apparatus including electrooptical multipliers. 4,613,204, Cl. 350-96.140.
Vernay Laboratories, Inc.: *See—*
Edwards, Floyd V.; and Boehmer, Dennis A., 4,612,960, Cl. 137-846.000.
Vest, Richard: *See—*
Price, Floyd W.; and Vest, Richard, 4,612,852, Cl. 99-450.400.
Vetco Offshore Industries, Inc.: *See—*
Hughes, David W., 4,613,162, Cl. 285-27.000.
Hughes, David W.; and Milberger, Lionel J., 4,613,164, Cl. 285-27.000.
Vetter, Manfred. Tube sealing device. 4,612,961, Cl. 138-93.000.
Vickers Systems S.A.: *See—*
Balmer, Clifford J.; and Goddard, Richard, 4,612,846, Cl. 91-457.000.
Victor Company of Japan, Limited: *See—*
Ichinoi, Yutaka, 4,613,905, Cl. 358-167.000.
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Tanaka, Koji; Suzuki, Fujio; Kubo, Mitsuo; Kikuchi, Mitsuru; Sugiyama, Hiroyuki; and Amano, Yoshiaki, 4,613,908, Cl. 358-310.000.

Vidouta, Georges: *See—*
Chauvin, Yves; Commereuc, Dominique; Cruypelinck, Daniel; Hugues, Francois; and Vidouta, Georges, 4,613,726, Cl. 585-861.000.

Viereck, Eugene J., Jr.: *See—*
Kent, Edward J.; Lore, Dorris F.; and Viereck, Eugene J., Jr., 4,613,844, Cl. 338-314.000.

Vinal, Albert W.: *See—*
Crouse, William G.; Cunningham, Earl A.; and Vinal, Albert W., 4,613,915, Cl. 360-77.000.

Vincent, Steve M.: *See—*
Hood, Thomas G.; Vincent, Steve M.; and Mellentin, Stephen W., 4,613,530, Cl. 428-34.000.

Vindez, Pierre G., to P. V. Tool, Inc. Retracting positive feed drill with idle mode. 4,612,998, Cl. 173-19.000.

Vinegar, Harold J.; and Wellington, Scott L., to Shell Oil Company. Tomographic calibration apparatus. 4,613,754, Cl. 250-252.100.

Vinh, Kim L. Loop puzzle. 4,613,132, Cl. 273-158.000.

Visinand, Jean-Claude. Screw with filler-receiving head. 4,613,265, Cl. 411-83.000.

Viski, Peter; Simandi, Laszlo; Nagy, Ferenc; Besenyei, Gabor; Paszthy, Gyorgy; Pazmandi, Gyula; Szita, Istvan; Szilagyi, Gyula; Toth, Istvan; and Szigeti nee Kiss, Ilona, to MTA Kozponti Kemiai Kutato Intezet; and Borsodi Vegyi Kombinat. Process for preparing esters of thiolcarbamic acids. 4,613,461, Cl. 540-608.000.

Vitaloni, Alberto, to Vitaloni S.p.A. External rearview mirror for motor vehicles, which can be used selectively in an upright position and in a laterally-projecting position. 4,613,107, Cl. 248-481.000.

Vitaloni S.p.A.: *See—*
Vitaloni, Alberto, 4,613,107, Cl. 248-481.000.

Vives, Michel: *See—*
Lacombe, Alain; and Vives, Michel, 4,613,021, Cl. 188-218.0XL.

Vock, Manfred H.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,613,510, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,613,511, Cl. 426-535.000.

Voest-Alpine Aktiengesellschaft: *See—*
Eisenkolb, Klaus; Plochberger, Franz; and Puhringer, Johann, 4,613,035, Cl. 198-509.000.
Zitz, Alfred; Lerchbaum, Karl; Toferer, Werner; and Sussenbeck, Heinrich, 4,613,256, Cl. 405-299.000.

Vogel, Eva M.: *See—*
Sherwood, Richard C.; Tabor, William J.; Vogel, Eva M.; and Zappulla, Robert, 4,613,955, Cl. 365-27.000.

Vogel, John D., to Burke Marketing Services, Inc. Eye movement recording apparatus. 4,613,219, Cl. 351-209.000.

Voisine, Gary R., to Emhart Industries, Inc. Convoluted shaft actuator link for glassware forming machine. 4,613,353, Cl. 65-163.000.

Vokac, Peter R.; and Gerdes, Richard C. Method and system for modulating a carrier signal. 4,613,974, Cl. 375-37.000.

VOKO Franz Vogt & Co.: *See—*
Vonhausen, Robert; and Machste, Rainer, 4,612,863, Cl. 108-28.000.

Volland, Craig S. High rate solar still and process. 4,613,409, Cl. 203-10.000.

vom Braucke jun, Hans: *See—*
vom Braucke, Manfred; and vom Braucke jun, Hans, 4,613,272, Cl. 414-347.000.

vom Braucke, Manfred; and vom Braucke jun, Hans, to Bielefelder Kuchenmaschinen-und Transportgeratefabrik GmbH. Method of operation for loading a motorized floor truck and support carriage therefor. 4,613,272, Cl. 414-347.000.

vom Hofe, Dieter: *See—*
Meyer, Klaus; and vom Hofe, Dieter, 4,613,064, Cl. 222-456.000.

Vonhausen, Robert; and Machate, Rainer, to VOKO Franz Vogt & Co. Work table. 4,612,863, Cl. 108-28.000.

Vorberg, Dieter: *See—*
Arndt, Lutz; Bachmann, Paul; Berges, Hanns-Peter; Leier, Wolfgang; and Vorberg, Dieter, 4,612,957, Cl. 137-565.000.

Vserossiisky Nauchnoissledovatelsky Institut Vinogradarstva I Vinodelia Imeni Ya.I. Potapenko: *See—*
Konischev, Alexandr I.; Arestov, Vasily P.; Baburin, Vasily I.; and Ilchenko, Ljudmila P., 4,612,849, Cl. 99-277.100.

Wada, Hidekazu; and Ishikawa, Youhei, to Murata Manufacturing Co., Ltd. Dielectric resonator. 4,613,838, Cl. 333-232.000.

Wade, Richard C.: *See—*
Severson, Gerald R.; and Wade, Richard C., 4,613,735, Cl. 200-158.000.

Wagner, John H. Spare tire handling apparatus. 4,613,273, Cl. 414-463.000.

Wagner, John R., Jr.; and Clauson, Melvil B., to Mobil Oil Corporation. Multi-layer oriented polypropylene films. 4,613,547, Cl. 428-349.000.

Wagner, Richard: *See—*
Rosch, Joachim; Geisselmann, Heribert; and Wagner, Richard, 4,612,867, Cl. 112-314.000.

Wagstaff, Robert A.; and Glass, Emmett F., to New Holland Inc. Twine wrapping apparatus with stationary twine guide member. 4,612,855, Cl. 100-5.000.

Wakabayashi, Akitomo: *See—*
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.

Wakabayashi, Sumio: *See—*
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.

Wako Pure Chemical Industries Ltd.: *See—*
Yamanishi, Kazuhiko; Shintani, Akinori; Okajima, Satoru; and Hanada, Toshiro, 4,613,465, Cl. 260-394.000.

Waldhecker, Heinz-Dieter: *See—*
Henrich, Gunter; Hoffmann, Harald; Waldhecker, Heinz-Dieter; and Mey, Klaus-Peter, 4,613,344, Cl. 48-77.000.

Walker, Ian C., to Micro Consultants Limited. Repeated information detection. 4,613,857, Cl. 340-724.000.

Walker, James H. Unitary wall-mounted shelf. 4,613,049, Cl. 211-88.000.

Wallat, Siegfried: *See—*
Moeller, Hinrich; and Wallat, Siegfried, 4,613,622, Cl. 514-718.000.

Walles, Wilhelm E., to Dow Chemical Company, The. Open-cell composition and method of making same. 4,613,524, Cl. 427-243.000.

Wallick, David E.: *See—*
Relenyi, Attila G.; Wallick, David E.; and Streit, Jill D., 4,613,671, Cl. 349-274.000.

Wallis, Christopher J.: *See—*
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Hayes, Norman F., 4,613,597, Cl. 514-211.000.

Walter, John; Roth, Donald J.; and Kubis, Charles S., to Continental Can Company, Inc. Hot melt material dispenser. 4,613,062, Cl. 222-146.200.

Walter, Robert J.; and Marker, Harold E., to Rockwell International Corporation. Superplastic alloys formed by electrodeposition. 4,613,388, Cl. 148-425.000.

Wang, David N.: *See—*
Tam, Simon W.; Reade, Ronald P.; Wong, Jerry Y. K.; and Wang, David N., 4,613,400, Cl. 156-643.000.

Waranowitz, Benjamin, to Lellinger, David B. Crossing bell and flasher. 4,613,103, Cl. 246-473.00A.

Ward, Wendell; Kumar, Surinder; Mack, Melba; Keller, Lewis; and Fitzwater, Margaret, to Frito-Lay, Inc. Process for producing center-filled food products. 4,613,509, Cl. 426-283.000.

Wareing, James R., to Sandoz Pharmaceuticals Corp. Cholesterol biosynthesis inhibiting pyrazole analogs of mevalonolactone and its derivatives. 4,613,610, Cl. 514-406.000.

Warner, Robert T.: *See—*
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,613,847, Cl. 340-114.00R.

Warrington Inc.: *See—*
Cooper, Roderick A., 4,613,150, Cl. 280-615.000.

Washio, Michiyoshi: *See—*
Yoshimoto, Yoshio; Washio, Michiyoshi; and Yazaki, Chikayoshi, 4,613,907, Cl. 358-257.000.

Wastesaver Corporation: *See—*
MacDermid, John T., 4,613,412, Cl. 203-91.000.

Watanabe, Hideaki: *See—*
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Watanabe, Hideaki; Kawamura, Tamio; and Nagai, Yasushi, 4,613,571, Cl. 435-130.000.

Watanabe, Katsuyuki: *See—*
Shibata, Akira; Yoshioka, Atsushi; and Watanabe, Katsuyuki, 4,613,912, Cl. 360-19.100.

Wataru, Komatsu: *See—*
Seiji, Shibuya; Tuguo, Satoh; Wataru, Komatsu; and Takeo, Shimuzu, 4,613,205, Cl. 350-96.250.

Watkins, Randy W., to Teletron Security, Inc. Multiple-zone intrusion detection system. 4,613,848, Cl. 340-541.000.

Watkins, Richard W.: *See—*
Jablonski, Daniel G.; and Watkins, Richard W., 4,613,810, Cl. 323-271.000.

Watling, Nigel C. Suspension ladder. 4,613,013, Cl. 182-20.000.

Watson, Harold K. Resilient therapeutic device with timer and indicator. 4,613,130, Cl. 272-135.000.

Watson, Robert L., to Weyerhaeuser Company. Bulk shipping container. 4,613,045, Cl. 206-512.000.

Weaver, John A.: *See—*
Park, David B.; Weaver, John A.; and Zumbrum, A. Scott, 4,613,037, Cl. 198-778.000.

Weber, Eckard: *See—*
Barchas, Jack D.; Weber, Eckard; Evans, Christopher J.; Chang, Jaw-Kang; Lorenz, Robin G.; and Roth, Kevin A., 4,613,586, Cl. 514-13.000.

Wechs, Friedbert: *See—*
Gerlach, Klaus; Mathes, Nikolaus; Pitowski, Hans-Jurgen; and Wechs, Friedbert, 4,612,688, Cl. 28-104.000.

Wegerle, Dieter: *See—*
Thomas, Michael; Neumann, Peter; Wegerle, Dieter; and Krallmann, Reinhold, 4,613,334, Cl. 8-442.000.

Wei, Ching-Yeu: *See—*
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,613,882, Cl. 357-23.300.

Weider, John J.: *See—*
Konstant, Anthony N.; and Weider, John J., 4,613,270, Cl. 414-276.000.

Weiler, Rolf; Thiel, Rudolf; Bach, Uwe; and Panek, Peter, to ITT Industries, Inc. Braking caliper for a spot-type disc brake. 4,613,018, Cl. 188-72.400.

Weinert, Friedrich. Telephone sterilizer. 4,613,928, Cl. 362-88.000.

Weinsheimer, Wolfram: *See—*
Dietrich, Ralph; Jocham, Dieter; Unsold, Eberhard; Weinsheimer, Wolfram; and Gorisch, Wolfram, 4,612,938, Cl. 128-665.000.
Weirich, Walter; and Dettmers, Michael, to Gewerkschaft Eisenhutte Westfalia. Hydraulic control arrangement. 4,613,257, Cl. 405-302.000.
Weiss, Michael A., to Ball Corporation. Method and apparatus for matched impedance feeding of microstrip-type radio frequency antenna structure. 4,613,868, Cl. 343-700.0MS.
Weisz, William, to Singer Company, The. Spring system for push-button control in a sewing machine. 4,612,821, Cl. 74-483.0PB.
Weitzel, Otto, to Robert Bosch GmbH. Method of producing a time-multiplex color television signal. 4,613,893, Cl. 358-11.000.
Wellington, Scott L.: *See—*
Vinegar, Harold J.; and Wellington, Scott L., 4,613,754, Cl. 250-252.100.
Wells, Rodney E.: *See—*
Kucheria, Chhattar S.; and Wells, Rodney E., 4,613,516, Cl. 427-2.000.
Welter, Jean-Marie; and Rudman, Peter, to Kernforschungsanlage Julich. Method of making magnesium-containing metal granulate for the storage of hydrogen. 4,613,362, Cl. 75-0.50B.
Wendell, David; and Mulgrew, Thomas M., Jr., to Wendell Textiles. Fusible coatings for fabrics. 4,613,538, Cl. 428-198.000.
Wendell Textiles: *See—*
Wendell, David; and Mulgrew, Thomas M., Jr., 4,613,538, Cl. 428-198.000.
Wengert, Rolf: *See—*
Kobale, Manfred; Trausch, Gunter; and Wengert, Rolf, 4,613,399, Cl. 156-634.000.
Wenzel, Werner, to Nordischer Machinenbau Rud. Baader GmbH & Co. KG. Device for sorting fish. 4,613,031, Cl. 198-399.000.
Westek Associates: *See—*
Roorda, John W., 4,613,790, Cl. 315-72.000.
Westinghouse Canada Inc.: *See—*
Vali, Enn, 4,613,749, Cl. 250-202.000.
Westinghouse Electric Corp.: *See—*
Cibulka, Frank; and Stacey, Eric J., 4,613,932, Cl. 363-54.000.
Evans, Gary E., 4,613,836, Cl. 333-159.000.
Foster, John P., 4,613,479, Cl. 376-416.000.
Kwon, Young J.; and Stoltz, Richard A., 4,613,366, Cl. 75-84.500.
Marshall, James B., 4,613,253, Cl. 405-195.000.
Sharbaugh, John E., 4,613,478, Cl. 376-290.000.
Vaerewyck, Eugene G.; Chen, Cheng-Lin; and Asars, Juris A., 4,613,811, Cl. 324-96.000.
Westmont, Inc.: *See—*
Durant, Will G., 4,612,964, Cl. 141-68.000.
Westrup, Bernhard; and Marcoll, Joachim, to Dragerwerk Aktiengesellschaft. Indicator for determining organic isocyanates on a carrier. 4,613,575, Cl. 436-106.000.
Weyerhaeuser Company: *See—*
Gess, Jerome M., 4,613,406, Cl. 162-49.000.
Watson, Robert L., 4,613,045, Cl. 206-512.000.
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., to Dow Chemical Company, The. Antibiotic A26201-1 and antibiotic A26201-2 produced by a novel strain of actinoplanes. 4,613,503, Cl. 424-117.000.
Whang, Sung-Hyun, to Northeastern University. Cold-hearth melt-spinning apparatus for providing continuous casting of refractory and reactive alloys. 4,612,973, Cl. 164-508.000.
Wheeler, Dale K., to Black & Decker Inc. Field coil winding. 4,612,702, Cl. 29-596.000.
Wheeler, Harold E. Cross slide contouring box tool. 4,612,834, Cl. 82-19.000.
Whelchel, Robert C.; and Sanderson, Roger S., to Sanderson, Roger S. Method of operating an expandable chamber with delay valve. 4,612,872, Cl. 116-218.000.
Whirlpool Corporation: *See—*
Richards, Paul L., 4,613,739, Cl. 219-10.55B.
White, Gregory G.: *See—*
Lovendusky, Charles M.; and White, Gregory G., 4,612,699, Cl. 29-739.000.
White, Lloyd R.: *See—*
Forester, Roger J.; and White, Lloyd R., 4,613,350, Cl. 65-2.000.
White, Taryn M.: *See—*
Hendrix, James E.; Daniels, John Y.; and White, Taryn M., 4,613,333, Cl. 8-115.700.
Whitman, Victoria E. Urinal attachment for toilet. 4,612,676, Cl. 4-300.300.
Wiand, Ronald C. Coolant filtering sytem. 4,613,437, Cl. 210-315.000.
Wichmann, Guenter, to Eltro GmbH. Laser range finder with non-linearity compensation. 4,613,231, Cl. 356-5.000.
Wickes Manufacturing Company: *See—*
De Leeuw, William L.; and Creighton, Kenneth R., 4,612,823, Cl. 74-533.000.
Wieme, Peter: *See—*
Schoettle, Klaus; Dietze, Herbert; Dreyer, Juergen; Kamm, Eugen; Wieme, Peter; and Frank, Volker, 4,613,095, Cl. 242-198.000.
Wienert, Fritz O. Process of making silicon, iron and ferroalloys. 4,613,363, Cl. 75-10.620.
Wiesejahn, Jurgen: *See—*
Knecht, Siegfried; and Wiesejahn, Jurgen, 4,613,750, Cl. 250-223.00R.
Wight, William W.; and Becker, Richard A., to Separex Corporation. Membrane assembly for fluid separations-disk. 4,613,436, Cl. 210-232.000.
Wilder, Joseph; and Ray, Rajarshi, to Object Recognition Systems, Inc. Robotic acquisition of objects by means including histogram techniques. 4,613,269, Cl. 364-513.000.
Wilh. Quester Maschinenfabrik GmbH: *See—*
Ulbrich, Hans-Joachim; and Quester, Horst, 4,613,060, Cl. 222-61.000.
Wilkins, Walter B., to Phares and Wilkins Mfg. Co. Sand fighter with folding frame. 4,612,997, Cl. 172-776.000.
Wilkinson Sword Limited: *See—*
Althaus, Wolfgang, 4,612,705, Cl. 30-53.000.
Williams, Joel L.; Dunn, Terry S.; O'Connell, James P.; and Montgomery, David, to Becton, Dickinson and Company. Heparinization of plasma treated surfaces. 4,613,517, Cl. 427-2.000.
Williams, Robert E. Ice fishing hole heater. 4,612,910, Cl. 126-360.00R.
Williams, Robert J.: *See—*
Gokcen, Cem; and Williams, Robert J., 4,613,531, Cl. 428-35.000.
Williams, Roger L.: *See—*
Atkin, Edward; and Williams, Roger L., 4,613,050, Cl. 215-11.00B.
Williams, Thomas M., Jr. Self-coupling trailer hitch. 4,613,149, Cl. 280-508.000.
Willis, William R.; Hunter, James D.; and Lewis, Max L., to Combustion Engineering, Inc. Combustion air control in an in-line flame arrestor. 4,613,303, Cl. 431-346.000.
Wilson, Bryce H., to Continental Disc Corporation. Low pressure venting panel. 4,612,739, Cl. 52-1.000.
Wilson, James B., to U.S. Philips Corporation. Sine bar mechanism and monochromator and spectrophotometer including such a sine bar mechanism. 4,613,233, Cl. 356-328.000.
Wilson, Owen H.: *See—*
Wishart, Scott A.; Pecak, Tadeusz; Wilson, Owen H.; and Boon, Anthony J., 4,613,127, Cl. 271-274.000.
Winegar, Brian G.: *See—*
Esper, Michael J.; Haeberle, Russell J.; and Winegar, Brian G., 4,613,843, Cl. 336-232.000.
Winston, Anthony; and Varaprasad, D. V. P. R., to Research Corporation. Polymeric iron chelators. 4,613,616, Cl. 514-507.000.
Winter, Christopher L., to Humphreys & Glasgow, Ltd. Production of synthesis gas. 4,613,492, Cl. 423-359.000.
Wishart, Scott A.; Pecak, Tadeusz; Wilson, Owen H.; and Boon, Anthony J., to NCR Corporation. Automatic retard adjustment mechanism for sheet feeding. 4,613,127, Cl. 271-274.000.
Witte, Fritz, to Womako Maschinenkonstruktionen GmbH. Machine for making wire comb binders. 4,612,963, Cl. 140-105.000.
Wohl, Ronald A.: *See—*
Diamond, Julius; Lumma, William C., Jr.; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,613,609, Cl. 514-396.000.
Wolf, Edward L.: *See—*
Burkey, Bruce C.; VanHeyningen, Roger S.; Spaulding, Richard A.; and Wolf, Edward L., 4,613,895, Cl. 358-41.000.
Wolf, Fred C.: *See—*
Bushyhead, Jess C.; Kolster, Harvey L.; Lowry, Michael G.; and Wolf, Fred C., 4,613,047, Cl. 211-55.000.
Wolf, Horst; and Dinkelmann, Friedrich, to Zinser Textilmaschinen GmbH. Drive for multiple-spindle twisting or spinning machine. 4,612,760, Cl. 57-105.000.
Wolf, Horst, to Zinser Textilmaschinen GmbH. Drive for spinning or twisting machine. 4,612,761, Cl. 57-105.000.
Wolf, Rodney A.; and Zech, Alan G., to Kimberly Hills, Ltd. Robotic agricultural system with tractor supported on tracks. 4,612,996, Cl. 172-26.000.
Wolfe, Steven R.: *See—*
Gregory, James L.; and Wolfe, Steven R., 4,613,052, Cl. 215-252.000.
Wolowodiuk, Catherine: *See—*
Laskowski, Edward J.; and Wolowodiuk, Catherine, 4,613,417, Cl. 204-129.850.
Womako Maschinenkonstruktionen GmbH: *See—*
Witte, Fritz, 4,612,963, Cl. 140-105.000.
Wong, Andrew C. C.; Fearnhead, Graham R.; and Gale, Simon J., to Standard Telephones and Cables Public Limited Company. Digital Navstar receiver. 4,613,977, Cl. 375-97.000.
Wong, Jerry Y. K.: *See—*
Tam, Simon W.; Reade, Ronald P.; Wong, Jerry Y. K.; and Wang, David N., 4,613,400, Cl. 156-643.000.
Wong, Kee-Shong: *See—*
Palfery, Kenneth J.; Maharaj, Kenrick B.; Malcom, John S.; Puckering, Donald R.; and Wong, Kee-Shong, 4,612,697, Cl. 29-568.000.
Wood, Charles F., to Indal Technologies Inc. Gear connection and brake assembly. 4,613,282, Cl. 416-36.000.
Wood, John A. V. Automatically disconnecting safety connector for aquatic apparatus. 4,613,311, Cl. 441-130.000.
Woods, Quentin T., to Boeing Company, The. Drill motor assembly with gimbal normality and clamp-up capability. 4,613,262, Cl. 409-211.000.
Woynar, Helmut: *See—*
Konig, Klaus; Pedain, Josef; and Woynar, Helmut, 4,613,686, Cl. 560-335.000.
Wreath, Clarence F.; and Keller, Robert D., Jr., to Sophisticated Systems, Inc. Electrolytic chlorine and alkali generator for swimming pools and method. 4,613,415, Cl. 204-98.000.
Wright, David M., to Sunbeam Plastics Corporation. Dispensing package. 4,613,063, Cl. 222-153.000.

Wright, Harlan R., deceased: *See*—
Jacobsen, Stephen C.; Wright, Harlan R., deceased; and Pendell, Gail J., general personal representative, 4,613,331, Cl. 623-61.000.
Wright State University: *See*—
Schroeder, Jack A.; Carraher, Charles E., Jr.; and Schwarz, Richard A., 4,613,670, Cl. 549-211.000.
Wrobel, Gunter; and Koletzki, Ulrich, to Papst-Motoren GmbH & Co. KG. Electric motors. 4,613,778, Cl. 310-90.000.
Wuest, Hans: *See*—
Buchi, George H.; and Wuest, Hans, 4,613,710, Cl. 568-819.000.
Wulf, Helmut: *See*—
Christ, Hubertus; and Wulf, Helmut, 4,613,073, Cl. 237-12.30R.
Wunderer, Bernd, to GAO Gesellschaft fur Automation and Organisation mbH. Apparatus for determining the weight per unit area of sheet-like material. 4,612,807, Cl. 73-580.000.
Wusz, Timothy: *See*—
Brass, Stephen; Croudace, Michael C.; and Wusz, Timothy, 4,612,880, Cl. 123-1.00A.
Wynn, Edward J.: *See*—
Halls, Lawrence M.; and Wynn, Edward J., 4,612,757, Cl. 56-10.200.
Xerox Corporation: *See*—
Foley, Geoffrey M. T.; Markovics, James M.; Berkes, John S.; Badesha, Santokh S.; and Abkowitz, Martin A., 4,613,557, Cl. 430-59.000.
Mort, Joseph; Jansen, Frank; Okumura, Koji; Grammatica, Steven J.; and Morgan, Michael A., 4,613,556, Cl. 430-57.000.
Ober, Christopher K.; Lok, Kar P.; Hair, Michael L.; and Branston, Randolph E., 4,613,559, Cl. 430-137.000.
Xomed, Inc.: *See*—
Hough, Jack V. D.; Richard, Gordon L.; Barton, Kenneth E., Jr.; DiCarlo, Paul; and Chow, Robert Y., 4,612,915, Cl. 128-1.00R.
Yabu, Hisao; Tsuji, Kenji; and Hirabayashi, Akinori, to Matsushita Electric Works, Ltd.; and Sauer, Hans. Relay for high-frequency circuits. 4,613,840, Cl. 335-128.000.
Yabunaka, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Starter dynamo. 4,613,761, Cl. 290-36.00R.
Yacobi, Ben G., to United States of America, Energy. Electron-beam-induced information storage in hydrogenated amorphous silicon device. 4,613,519, Cl. 427-39.000.
Yaginuma, Satoshi: *See*—
Fukukawa, Kiyofumi; Hirano, Takao; Tsujino, Masatoshi; Ueda, Tooru; Fujii, Tadashiro; and Yaginuma, Satoshi, 4,613,666, Cl. 544-277.000.
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, to Shin Nisso Kako Co., Ltd. Chromogenic recording materials. 4,613,879, Cl. 346-209.000.
Yamada, Kouji: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,613,593, Cl. 514-106.000.
Yamaguchi, Akira: *See*—
Seshimoto, Osamu; Koizumi, Teruaki; Saito, Yoshio; and Yamaguchi, Akira, 4,613,421, Cl. 204-412.000.
Yamaguchi, Kimio; and Chiba, Yoshinori, to Fukuda Denshi Co., Ltd. Clip-type electrode for electrocardiographs. 4,612,936, Cl. 128-644.000.
Yamaguchi, Shigehiro: *See*—
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Ohya, Yoshihiro, 4,613,842, Cl. 336-218.000.
Yamaguchi, Shunzo: *See*—
Suzuki, Hirofumi; Yoshida, Hitoshi; and Yamaguchi, Shunzo, 4,613,455, Cl. 252-516.000.
Yamaguchi, Teruo: *See*—
Takakura, Yoshio; Abo, Ryo; Ishiyama, Isamu; Kajiwara, Toshiyuki; Higuchi, Tetsuya; Yamaguchi, Teruo; Mitsui, Hiromitsu; Furuzono, Yoshihisa; and Hamada, Shunichi, 4,613,093, Cl. 242-55.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshikawa, Masaaki, 4,612,885, Cl. 123-90.270.
Yamamoto, Hajime; Matsuda, Hiromu; Yubakami, Keiichi; and Takashima, Yuji, to Matsushita Electric Industrial Co., Ltd. Image forming method using electrically conductive, light transmissive particles. 4,613,555, Cl. 430-45.000.
Yamamoto, Shigekazu. Fall prevention means for furniture. 4,612,740, Cl. 52-36.000.
Yamamoto, Tadashi: *See*—
Furuhashi, Hiroyuki; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,613,579, Cl. 502-115.000.
Yamanashi, Teraki: *See*—
Matsuno, Mitsuo; Yamanashi, Teraki; Yuasa, Hitoshi; and Imai, Hirosuke, 4,613,456, Cl. 252-522.00R.
Yamanishi, Kazuhiko; Shintani, Akinori; Okajima, Satoru; and Hanada, Toshiro, to Wako Pure Chemical Industries Ltd. Triphenyl methane derivatives and method of quantitatively measuring an oxidative substance. 4,613,465, Cl. 260-394.000.
Yamasaki, Takeshi: *See*—
Miyamoto, Shigehiko; and Yamasaki, Takeshi, 4,613,525, Cl. 427-256.000.
Yamashita, Yasuo; Kiyomura, Yoshiteru; and Tohyama, Shunroku, to Toray Industries, Inc. Inclined artifical fur and method of manufacturing the same. 4,613,529, Cl. 428-15.000.
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, to Eisai Co., Ltd. Therapeutic and preventive agent containing dolichol. 4,613,593, Cl. 514-106.000.
Yamazaki, Hiroshi; and Matsumoto, Kouchi. Production of fructose syrup. 4,613,377, Cl. 127-39.000.
Yamazaki, Toshihiko; Murase, Shoji; Suzuki, Katsuyuki; and Iwatsuki, Makoto, to Director, Fruit Tree Research Foundation; and Ajinomoto Co., Ltd. Flower-thinning agent for fruit trees. 4,613,359, Cl. 71-122.000.
Yanadori, Michio; Kawano, Tomohiro; Miyamoto, Seigo; Nara, Yasuaki; and Oguri, Masahiro, to Hitachi, Ltd. Heat storage device. 4,612,974, Cl. 165-10.000.
Yanagihara, Toshimichi: *See*—
Maruzeni, Shoji; Yanagihara, Toshimichi; and Yasuda, Nozomi, 4,613,514, Cl. 426-607.000.
Yanagiuchi, Shigenobu: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,613,944, Cl. 364-513.500.
Yang, Bea-Jane L.: *See*—
Chiong, Kaolin N.; Yang, Bea-Jane L.; and Yang, Jer-Ming, 4,613,398, Cl. 156-628.000.
Yang, Jer-Ming: *See*—
Chiong, Kaolin N.; Yang, Bea-Jane L.; and Yang, Jer-Ming, 4,613,398, Cl. 156-628.000.
Yang, Miriam. Torque wrench. 4,612,830, Cl. 81-63.200.
Yanmar Diesel Engine Co., Ltd.: *See*—
Tsujimura, Iwao; and Kubo, Katunori, 4,612,881, Cl. 123-27.0GE.
Yarger, Ronald G.: *See*—
Barnett, Ronald E.; and Yarger, Ronald G., 4,613,512, Cl. 426-548.000.
Yasoshima, Seikichi; Koyama, Mikio; and Okaniwa, Kenichiro, to Konishiroku Photo Industry Co., Ltd. Immunoassay method for measuring immunological antigen in fluid sample. 4,613,567, Cl. 435-7.000.
Yasuda, Nozomi: *See*—
Maruzeni, Shoji; Yanagihara, Toshimichi; and Yasuda, Nozomi, 4,613,514, Cl. 426-607.000.
Yates, Douglas A.: *See*—
Gonsiorawski, Ronald C.; and Yates, Douglas A., 4,612,698, Cl. 29-572.000.
Yates, Ronald L.; and Hagans, Patrick L., to Dow Chemical Company, The. Method of making corrosion resistant magnesium and aluminum oxyalloys. 4,613,386, Cl. 148-13.000.
Yazaki, Chikayoshi: *See*—
Yoshimoto, Yoshio; Washio, Michiyoshi; and Yazaki, Chikayoshi, 4,613,907, Cl. 358-257.000.
Yeda Research and Development Co. Ltd.: *See*—
Kessler, Efrat; Spierer, Abraham; and Blumberg, Shmaryahum, 4,613,587, Cl. 514-19.000.
Yedid, Henri; and Audoin, Maurice, to Thomson CSF. Method for processing X-ray images. 4,613,983, Cl. 378-99.000.
Yevich, Joseph P.: *See*—
Gammans, Richard E.; Smith, David W.; and Yevich, Joseph P., 4,613,600, Cl. 514-252.000.
Yew, Kwang: *See*—
McWilliam, Richard D.; Anderson, Andrew G.; McCharles, Donald A.; McLaren, Donald J.; and Yew, Kwang, 4,613,318, Cl. 474-74.000.
Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,613,360, Cl. 71-124.000.
Yokoi, Junji: *See*—
Umeno, Masayuki; Wakabayashi, Akitomo; Tomozane, Kazuo; Wakabayashi, Sumio; Okamoto, Hitoshi; and Yokoi, Junji, 4,613,373, Cl. 106-18.300.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, to Green Cross Corporation, The. Perfluoro-1-azatricyclic amines as blood substitutes. 4,613,605, Cl. 514-294.000.
Yokoyama, Kazumasa: *See*—
Fukaya, Chikara; Naito, Youichiro; and Yokoyama, Kazumasa, 4,613,614, Cl. 514-469.000.
Mizushima, Yutaka; Uchida, Katsuhiro; Masumoto, Shozoh; Tohno, Masao; Hashimoto, Yoshinobu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; Nabeta, Kiichiro; and Suyama, Tadakazu, 4,613,505, Cl. 424-80.000.
Yokoyama, Toshiharu: *See*—
Maki, Takao; and Yokoyama, Toshiharu, 4,613,700, Cl. 568-435.000.
Yonaiyama, Rikio; Kasai, Michio; and Atsumi, Nobukazu, to Chisso Corporation. Polypropylene compositions containing polyamides reinforced by glass fibers. 4,613,647, Cl. 524-514.000.
Yonemori, Takaji: *See*—
Miyake, Hiroyuki; and Yonemori, Takaji, 4,613,229, Cl. 355-15.000.
Yoo, Bok-Ryul: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,613,491, Cl. 423-347.000.
Yoon, Heeyoung; and Statnick, Robert M., to Conoco Inc. Flue gas desulfurization process. 4,613,487, Cl. 423-244.000.
Yoshida, Hideo: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,613,944, Cl. 364-513.500.
Hashimoto, Shintaro; and Yoshida, Hideo, 4,613,985, Cl. 381-51.000.

Yoshida, Hitoshi: *See*—
Suzuki, Hirofumi; Yoshida, Hitoshi; and Yamaguchi, Shunzo, 4,613,455, Cl. 252-516.000.
Yoshida, Shinichi: *See*—
Higashi, Hidehiro; Shirono, Katsuhiro; Arima, Yuusaku; Nishimura, Yoichi; and Yoshida, Shinichi, 4,613,425, Cl. 208-89.000.
Yoshida, Tadao: *See*—
Hamada, Yuichiro; Fujiie, Kazuhiko; Ohtawa, Masanori; Nonaka, Chiaki; Yoshida, Tadao; and Haneda, Yoshiaki, 4,613,967, Cl. 369-221.000.
Yoshiga, Kenji, to Fuji Koki Manufacturing Co., Ltd. Method of forming a groove in a valve seat and the tool used in this method. 4,612,795, Cl. 72-478.000.
Yoshikawa, Haruzo, to Seiko Instruments & Electronics Ltd. Electronic metronome. 4,612,841, Cl. 84-484.000.
Yoshikawa, Masaaki, to Yamaha Hatsudoki Kabushiki Kaisha. Camshaft bearing arrangement for overhead cam engine. 4,612,885, Cl. 123-90.270.
Yoshikawa, Masato: *See*—
Oyachi, Tomio; Takahashi, Minoru; Izuhara, Koichi; Akiyama, Setsuo; and Yoshikawa, Masato, 4,613,403, Cl. 156-643.000.
Yoshimoto, Yoshio; Washio, Michiyoshi; and Yazaki, Chikayoshi, to Murata Giken Kabushiki Kaisha. Facsimile receiver. 4,613,907, Cl. 358-257.000.
Yoshinaga, Yoshitsugu: *See*—
Ushigoe, Tomio; Kobayashi, Takeo; Yoshinaga, Yoshitsugu; Tsuchiya, Keiro; and Miyagawa, Kazuo, 4,612,832, Cl. 82-3.000.
Yoshinaka, Sinzi: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Sinzi; Morita, Kousaku; Saito, Morikuni; and Kinoshita, Kimiaki, 4,613,879, Cl. 346-209.000.
Yoshioka, Atsushi: *See*—
Shibata, Akira; Yoshioka, Atsushi; and Watanabe, Katsuyuki, 4,613,912, Cl. 360-19.100.
Yoshizaki, Kouji, to Toyota Jidosha Kabushiki Kaisha. Valve actuating apparatus for resting the operation of a valve in internal combustion engine. 4,612,887, Cl. 123-198.00F.
Young, A. Byron: *See*—
Norton, Jane A.; Twyman, Diana L.; Young, A. Byron; and Rapp, Robert, 4,613,323, Cl. 604-43.000.
Young, W. Ronald, to Harris Corporation. Current compensation for logic gates. 4,613,772, Cl. 307-443.000.
Yuasa, Hitoshi: *See*—
Matsuno, Mitsuo; Yamanashi, Teraki; Yuasa, Hitoshi; and Imai, Hirosuke, 4,613,456, Cl. 252-522.00R.
Yubakami, Keiichi: *See*—
Yamamoto, Hajime; Matsuda, Hiromu; Yubakami, Keiichi; and Takashima, Yuji, 4,613,555, Cl. 430-45.000.
Yuki, Heimei; and Okamoto, Yoshio, to Daicel Chemical Industries, Ltd. Novel optically active polymer, preparation and use. 4,613,442, Cl. 252-1.000.
Yunes, Yamil R. Folding knife. 4,612,706, Cl. 30-160.000.
Zaklady Urzadzen Chemicznych Metalchem: *See*—
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,790, Cl. 72-96.000.
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,791, Cl. 72-98.000.
Zanelli, Claudio I.: *See*—
Cribbs, Robert W.; and Zanelli, Claudio I., 4,612,809, Cl. 73-626.000.
Zanias, Theodore J.; and Fairchild, Elwood M., to Masco Corporation. Vent flow monitor. 4,613,297, Cl. 431-16.000.
Zappulla, Robert: *See*—
Sherwood, Richard C.; Tabor, William J.; Vogel, Eva M.; and Zappulla, Robert, 4,613,955, Cl. 365-27.000.
Zardi, Umberto, to Zardi, Umberto; and Ammonia Casale S.A. Process for urea production. 4,613,696, Cl. 564-67.000.
Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,613,341, Cl. 44-57.000.
Zeamer, Geoffrey H., to Geo-Senaors Corporation. Cryogenic magnetic probe having new substrate. 4,613,816, Cl. 324-248.000.
Zech, Alan G.: *See*—
Wolf, Rodney A.; and Zech, Alan G., 4,612,996, Cl. 172-26.000.
Zehnder, Jurg, to Swiss Aluminium Ltd. Three level vehicle body for railcars, with force distributing triangular shaped plates. 4,612,862, Cl. 105-340.000.
Zellner, Wilhelm: *See*—
Andra, Wolfhart; Zellner, Wilhelm; Kunzl, Willi; Falkner, Horst; Gohler, Bernhard; and Andra, Hans-Peter, 4,612,747, Cl. 52-250.000.
Zeman, Nancy W., to CPC International Inc. Novel thermostable, aciduric alpha-amylase and method for its production. 4,613,570, Cl. 435-99.000.
Zenith Electronics Corporation: *See*—
Kent, Dallas L., 4,613,979, Cl. 375-108.000.
Zerpa, Carlos: *See*—
Sepulveda, Gonzalo; Rosa-Brussin, Marcos; Carrion, Nereida; Roa, Pedro; Morales Ruiz, Alfredo; Guitian, Jose; Rodriguez, Otto; and Zerpa, Carlos, 4,613,427, Cl. 208-111.000.
Zieher, Peter: *See*—
Burkel, Rainer; and Zieher, Peter, 4,612,845, Cl. 91-448.000.
Zillig, Steven R.: *See*—
Caroll, James E.; and Zillig, Steven R., 4,612,953, Cl. 137-327.000.
Zimmer, Inc.: *See*—
Lower, Jerry L., 4,612,920, Cl. 128-92.0BA.
Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst; and Dinkelmann, Friedrich, 4,612,760, Cl. 57-105.000.
Wolf, Horst, 4,612,761, Cl. 57-105.000.
Zitz, Alfred; Lerchbaum, Karl; Toferer, Werner; and Sussenbeck, Heinrich, to Voest-Alpine Aktiengesellschaft. Supporting frame. 4,613,256, Cl. 405-299.000.
Zletz, Alex: *See*—
Kouba, Jay K.; and Zletz, Alex, 4,613,707, Cl. 568-864.000.
Zobel, Jurgen: *See*—
Diener, Jorg; and Zobel, Jurgen, 4,613,232, Cl. 356-124.000.
Zoller-Kipper GmbH: *See*—
Nasb, Jakob, 4,613,271, Cl. 414-303.000.
Zscheile, John W., Jr.: *See*—
Currie, Robert J.; Rushforth, Craig K.; and Zscheile, John W., Jr., 4,613,860, Cl. 340-825.570.
Zub, Ryszard: *See*—
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,790, Cl. 72-96.000.
Przybyla, Janusz; Gozdziewicz, Zygmunt; Szal, Andrzej; Zub, Ryszard; and Maczynski, Andrzej, 4,612,791, Cl. 72-98.000.
Zuckerbrod, Jesse: *See*—
Shaw, Anthony; and Zuckerbrod, Jesse, 4,613,039, Cl. 206-287.100.
Zumbrum, A. Scott: *See*—
Park, David B.; Weaver, John A.; and Zumbrum, A. Scott, 4,613,037, Cl. 198-778.000.
Zumbusch, Steven J.: *See*—
Bernstrom, Marvin L.; and Zumbusch, Steven J., 4,613,292, Cl. 418-61.00B.
Zupancic, Joseph J.; and Swedo, Raymond J., to Allied Corporation. Composite membranes based on interpenetrating polymer networks. 4,613,440, Cl. 210-490.000.
501 Olympus Corporation: *See*—
Messinger, Elmar K., 4,613,931, Cl. 362-373.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF SEPTEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Dow Corning Corporation: *See*—
Plueddemann, Edwin P., Re. 32,250, Cl. 252-389.100.

Esmay, Donald L., to Minnesota Mining and Manufacturing Company. Linerless double-coated pressure-sensitive adhesive tape. Re. 32,249, Cl. 428-40.000.

Funamoto, Hiroyuki: *See*—
Matsuno, Kenji; and Funamoto, Hiroyuki, Re. 32,251, Cl. 219-64.000.

Kay, Leslie. Method of and apparatus for providing information as to the existence or position of objects. Re. 32,252, Cl. 367-102.000.

Matsuno, Kenji; and Funamoto, Hiroyuki, to Toyo Seikan Kaisha, Limited. Method of electric welding tinfree cans. Re. 32,251, Cl. 219-64.000.

Minnesota Mining and Manufacturing Company: *See*—
Esmay, Donald L., Re. 32,249, Cl. 428-40.000.

Plueddemann, Edwin P., to Dow Corning Corporation. Stabilization of silicates using salts of substituted nitrogen or sulfur containing siliconates. Re. 32,250, Cl. 252-389.100.

Toyo Seikan Kaisha, Limited: *See*—
Matsuno, Kenji; and Funamoto, Hiroyuki, Re. 32,251, Cl. 219-64.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ferris, Carlisle K. Camouflaged aircraft, surface vessel or vehicle or the like. B1 4,089,491, 9-23-86, Cl. 244-1.00R.

Gebruder Bellmer KG, Maschinenfabrik, Firma: *See*—
Wenzel, Lothar; and Kollmar, Ulrich, B1 3,984,329, Cl. 210-396.000.

Haglund, William A.; and Reiling, Theodore P. Perennial weed control by deep placement of volatile soil fumigants. B1 3,964,405, 9-23-86, Cl. 111-6.000.

Henk, Charles R. Skimmer apparatus for swimming pools. B1 4,501,659, 9-23-86, Cl. 210-169.000.

Hesston Corporation: *See*—
White, Allen A., B1 4,132,164, Cl. 100-189.000.

Kinoshita, Taketoshi: *See*—
Shimizu, Kimihiro; Nakahara, Tsuguji; and Kinoshita, Taketoshi, B1 4,495,285, Cl. 435-215.000.

Kollmar, Ulrich: *See*—
Wenzel, Lothar; and Kollmar, Ulrich, B1 3,984,329, Cl. 210-396.000.

Matney, Arthur. Blister pack panel for face powder compact display. B1 4,469,226, 9-23-86, Cl. 206-470.000.

Nakahara, Tsuguji: *See*—
Shimizu, Kimihiro; Nakahara, Tsuguji; and Kinoshita, Taketoshi, B1 4,495,285, Cl. 435-215.000.

Nippon Chemiphar Co., Ltd.: *See*—
Shimizu, Kimihiro; Nakahara, Tsuguji; and Kinoshita, Taketoshi, B1 4,495,285, Cl. 435-215.000.

Reiling, Theodore P.: *See*—
Haglund, William A.; and Reiling, Theodore P., B1 3,964,405, Cl. 111-6.000.

Shimizu, Kimihiro; Nakahara, Tsuguji; and Kinoshita, Taketoshi, to Nippon Chemiphar Co., Ltd. Plasminogen activator derivatives. B1 4,495,285, 9-23-86, Cl. 435-215.000.

Wenzel, Lothar; and Kollmar, Ulrich, to Gebruder Bellmer KG, Maschinenfabrik, Firma. Device for extracting liquid from sludge. B1 3,984,329, 9-23-86, Cl. 210-396.000.

White, Allen A., to Hesston Corporation. Baler loading method and apparatus. B1 4,132,164, 9-23-86, Cl. 100-189.000.

LIST OF DESIGN PATENTEES

Airway Industries, Inc.: *See*—
Davis, Michael; and Wilhoit, William H., 285,747, Cl. D3-48.000.

Aktiebolaget Bygg-och Transportekonomi (BT) Div. Nike Hydraulics: *See*—
Persson, Anders, 285,854, Cl. D34-31.000.

Aktiebolaget Bygg-och Transportekonomi Division Nike Hydraulics: *See*—
Persson, Anders, 285,855, Cl. D34-31.000.

Albyn of Stonehaven, Ltd.: *See*—
Smith, Hugh; and Smith, Donald H., 285,838, Cl. D28-30.000.

Allibert S.A.: *See*—
Hubert, Manfred, 285,853, Cl. D34-21.000.

Allison Corporation: *See*—
Langensiepen, Eric, 285,784, Cl. D12-193.000.

American Commercial Incorporated: *See*—
Laslo, Larry R., 285,762, Cl. D7-5.000.
Laslo, Larry R., 285,763, Cl. D7-19.000.
Laslo, Larry R., 285,764, Cl. D7-19.000.

American Home Products Corporation (Del): *See*—
Ronayne, Walter M., 285,833, Cl. D23-150.000.

Anderson, Stephen J., to Merrill Manufacturing Company. Combined yard hydrant and head with removable cap. 285,824, 9-23-86, Cl. D23-12.000.

Anderson, Stephen J., to Merrill Manufacturing Company. Head section with removable cap for yard hydrants. 285,825, 9-23-86, Cl. D23-12.000.

Aoki, Takao: *See*—
Takahashi, Akemi; Aoki, Takao; Kiyota, Toru; and Tanaka, Ryuuichirou, 285,791, Cl. D14-80.000.

Arehart, Robert W., to Emerson Electric Co. Drill press. 285,797, 9-23-86, Cl. D15-132.000.

AT&T Information Systems Inc.: *See*—
Chandler, David L.; and Johnson, Chris G., 285,795, Cl. D14-115.000.

Beal, Glenn I.: *See*—
Oyler, Thomas; May, William J.; and Beal, Glenn I., 285,828, Cl. D23-34.000.

Beaty, W. Roger. Plant support or the like. 285,754, 9-23-86, Cl. D6-403.000.

Berntsson, Tommy, to Monark AB. Exercycle. 285,816, 9-23-86, Cl. D21-194.000.

Bills, John E. Folding hairbrush. 285,750, 9-23-86, Cl. D4-136.000.

Bonner, Mark N.: *See*—
Smith, Douglas W.; and Bonner, Mark N., 285,770, Cl. D8-69.000.

Bourque, Rene, to Warrington Inc. Ice skate. 285,819, 9-23-86, Cl. D21-225.000.

Bourque, Rene, to Warrington Inc. Ice skate. 285,820, 9-23-86, Cl. D21-225.000.

Bridge, Norman: *See*—
Flory, Robert; and Bridge, Norman, 285,769, Cl. D8-31.000.

Bridge Products, Inc.: *See*—
Flory, Robert; and Bridge, Norman, 285,769, Cl. D8-31.000.

Brunnegard, Ake; Nilsson, Erik W.; and Ring, Hans. Set of pillars and bushes. 285,798, 9-23-86, Cl. D15-143.000.
Byers, Robert J. Model train coupler. 285,814, 9-23-86, Cl. D21-141.000.
Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 285,787, Cl. D13-30.000.
Canon Kabushiki Kaisha: *See*—
Kadota, Toshihiko, 285,800, Cl. D16-31.000.
Cappel, Walter H.; and Hartenberger, Gerald W. Interlocking shelf bracket for a firewood rack or similar article. 285,773, 9-23-86, Cl. D8-380.000.
Carter, Rogers J. Necklace. 285,781, 9-23-86, Cl. D11-6.000.
Cathey, Wayne C., to Xerox Corporation. Electronic typewriter. 285,804, 9-23-86, Cl. D18-2.000.
Chandler, David L.; and Johnson, Chris G., to AT&T Information Systems Inc. Communication equipment cover. 285,795, 9-23-86, Cl. D14-115.000.
Cladek, James A. Combined heat reduction fan and elapsed operation time indicator for computer. 285,794, 9-23-86, Cl. D14-114.000.
Clark, Wardell F. Cart for pots, pans, lid and other kitchen utensils. 285,852, 9-23-86, Cl. D34-21.000.
Cowan, Keith B.: *See*—
Winegard, John R.; and Cowan, Keith B., 285,792, Cl. D14-90.000.
CTI International: *See*—
Morgan, Paul E., 285,834, Cl. D23-151.000.
Daddi, Adriana: *See*—
Fanfani, Mirella; and Daddi, Adriana, 285,856, Cl. D6-575.000.
Daily, Terrill A.; and Mastro, Louis L., to Square D Company. Heater front cover. 285,830, 9-23-86, Cl. D23-128.000.
Daiwa Seiko, Inc.: *See*—
Iinuma, Kanji; and Kameda, Yasuhisa, 285,823, Cl. D22-140.000.
Dart Industries: *See*—
Zieff, Mark P., 285,766, Cl. D7-78.000.
Zieff, Mark P., 285,767, Cl. D7-78.000.
Dart Industries Inc: *See*—
Zieff, Mark P., 285,765, Cl. D7-78.000.
Davis, Gordon W. Notched holster. 285,822, 9-23-86, Cl. D3-101.000.
Davis, Michael; and Wilhoit, William H., to Airway Industries, Inc. Luggage case. 285,747, 9-23-86, Cl. D3-48.000.
Donahoe, William E. Combined tethered ring and game target. 285,811, 9-23-86, Cl. D21-62.000.
Doyel, John S. Paper brickmaking unit. 285,796, 9-23-86, Cl. D15-123.000.
Emerson Electric Co.: *See*—
Arehart, Robert W., 285,797, Cl. D15-132.000.
Fanfani, Mirella; and Daddi, Adriana. Curtain. 285,856, 9-23-86, Cl. D6-575.000.
Feinberg, Martin R.; and Knoepke, Eckhard, to Samsonite Corporation. Luggage case. 285,748, 9-23-86, Cl. D3-48.000.
Finn, Anneli. Doll garment. 285,815, 9-23-86, Cl. D2-185.000.
Flory, Robert; and Bridge, Norman, to Bridge Products, Inc. Tire repair tool. 285,769, 9-23-86, Cl. D8-31.000.
Forbes, Hampton E., Jr., to Westvaco Corporation. Packaging tray for food or the like. 285,777, 9-23-86, Cl. D9-416.000.
Friedman, Ronald A., to Gaydorus, Frank. Computer disk stand. 285,745, 9-23-86, Cl. D3-35.000.
Fryerich Putter Company: *See*—
Richardson, William E., 285,817, Cl. D21-218.000.
Fuji Mfg. Co. Ltd.: *See*—
Yamada, Teruo, 285,799, Cl. D15-146.000.
Fuziwara, Seiro; Kobori, Masao; and Takida, Norio, to Tokyo Electric O., Ltd. Cartridge for ink ribbon. 285,808, 9-23-86, Cl. D18-22.000.
Gallet, Adrien, to Jean Gallet et Fils S.A. Combined helmet and mask. 285,741, 9-23-86, Cl. D2-232.000.
Gaydorus, Frank: *See*—
Friedman, Ronald A., 285,745, Cl. D3-35.000.
Gehrie, Charles S.; and Kloin, Lester G., to Presto Lock, Inc. Dead bolt combination lock. 285,771, 9-23-86, Cl. D8-331.000.
General Motors Corporation: *See*—
Munson, Robert J., 285,786, Cl. D12-210.000.
Gilmour Manufacturing Co.: *See*—
Oyler, Thomas; May, William J.; and Beal, Glenn I., 285,828, Cl. D23-34.000.
Glasener, Kenneth A. Display. 285,810, 9-23-86, Cl. D20-10.000.
Green, Alfred, Jr. Illuminated boomerang. 285,812, 9-23-86, Cl. D21-82.000.
GTE Communication: *See*—
Harrison, Michael A.; and Story, William R., 285,790, Cl. D14-53.000.
Hanses, Ulf M. Tooth elevator for use in extractions. 285,835, 9-23-86, Cl. D24-10.000.
Harper, Irene. Plant rack. 285,756, 9-23-86, Cl. D6-405.000.
Harrison, Michael A.; and Story, William R., to GTE Communication. Combined handset and base telephone set. 285,790, 9-23-86, Cl. D14-53.000.
Hartenberger, Gerald W.: *See*—
Cappel, Walter H.; and Hartenberger, Gerald W., 285,773, Cl. D8-380.000.
Heap, Jean W., to Pendelfin Studios Limited. Table ornament. 285,782, 9-23-86, Cl. D11-157.000.
Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle. 285,827, 9-23-86, Cl. D23-28.000.
Hitachi, Ltd.: *See*—
Takahashi, Akemi; Aoki, Takao; Kiyota, Toru; and Tanaka, Ryuuichirou, 285,791, Cl. D14-80.000.
Hubert, Manfred, to Allibert S.A. Drop-leaf bar cart. 285,853, 9-23-86, Cl. D34-21.000.
Hughes, Philip C. Receptacle for collecting dispossble wrappers, packages and the like. 285,849, 9-23-86, Cl. D34-1.000.
Hunt, John V.; and Spreckelmeier, Lawrence E., to Senmed, Inc. Surgical stapler. 285,836, 9-23-86, Cl. D24-26.000.
Iida, Giichi; and Kawaharazuka, Yukio, to Kioritz Corporation. Power blower sweeper. 285,848, 9-23-86, Cl. D32-17.000.
Iinuma, Kanji; and Kameda, Yasuhisa, to Daiwa Seiko, Inc. Fishing reel bail arm. 285,823, 9-23-86, Cl. D22-140.000.
Jean Gallet et Fils S.A.: *See*—
Gallet, Adrien, 285,741, Cl. D2-232.000.
Johnson, Chris G.: *See*—
Chandler, David L.; and Johnson, Chris G., 285,795, Cl. D14-115.000.
Kadota, Toshihiko, to Canon Kabushiki Kaisha. Electrophotographic copier. 285,800, 9-23-86, Cl. D16-31.000.
Kameda, Yasuhisa: *See*—
Iinuma, Kanji; and Kameda, Yasuhisa, 285,823, Cl. D22-140.000.
Karlin, James, to Walker Telecommunications Corporation. Mobile telephone assembly including handset, cradle and mounting. 285,789, 9-23-86, Cl. D14-53.000.
Kawada Co. Ltd.: *See*—
Takahashi, Tokuo, 285,813, Cl. D21-108.000.
Kawaharazuka, Yukio: *See*—
Iida, Giichi; and Kawaharazuka, Yukio, 285,848, Cl. D32-17.000.
Kioritz Corporation: *See*—
Iida, Giichi; and Kawaharazuka, Yukio, 285,848, Cl. D32-17.000.
Kiyota, Toru: *See*—
Takahashi, Akemi; Aoki, Takao; Kiyota, Toru; and Tanaka, Ryuuichirou, 285,791, Cl. D14-80.000.
Kloin, Lester G.: *See*—
Gehrie, Charles S.; and Kloin, Lester G., 285,771, Cl. D8-331.000.
Kneisley, Rick A. Sports wrist brace. 285,821, 9-23-86, Cl. D21-233.000.
Knoepke, Eckhard: *See*—
Feinberg, Martin R.; and Knoepke, Eckhard, 285,748, Cl. D3-48.000.
Kobori, Masao: *See*—
Fuziwara, Seiro; Kobori, Masao; and Takida, Norio, 285,808, Cl. D18-22.000.
Kowa Company Ltd.: *See*—
Ogasawara, Takeo, 285,802, Cl. D16-132.000.
Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 285,776, 9-23-86, Cl. D9-401.000.
Langensiepen, Eric, to Allison Corporation. License plate holder. 285,784, 9-23-86, Cl. D12-193.000.
Laslo, Larry R., to American Commercial Incorporated. Snack basket. 285,762, 9-23-86, Cl. D7-5.000.
Laslo, Larry R., to American Commercial, Incorporated. Triple server tray. 285,763, 9-23-86, Cl. D7-19.000.
Laslo, Larry R., to American Commercial, Incorporated. Double server tray. 285,764, 9-23-86, Cl. D7-19.000.
Leone, Angela. Telephone-calculator console. 285,803, 9-23-86, Cl. D18-2.000.
Lewis, David R. Portable electronic equipment stand. 285,757, 9-23-86, Cl. D6-450.000.
Lock, Kenneth L., to Lockland Developments Pty. Ltd. Solar tile. 285,829, 9-23-86, Cl. D23-72.000.
Lockland Developments Pty. Ltd.: *See*—
Lock, Kenneth L., 285,829, Cl. D23-72.000.
Looney, John W. Eyeglasses. 285,801, 9-23-86, Cl. D16-102.000.
MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,774, 9-23-86, Cl. D9-389.000.
MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,775, 9-23-86, Cl. D9-389.000.
March, David, to Thomson Leeds Company Inc. Merchandise display stand. 285,758, 9-23-86, Cl. D6-465.000.
Mariol, James F., to Scott & Fetzer Company, The. Painting implement handle. 285,749, 9-23-86, Cl. D4-115.000.
Maron, Jeffrey. Wrist watch. 285,779, 9-23-86, Cl. D10-30.000.
Masco Corporation of Indiana: *See*—
Hill, Charles P.; and Spangler, Anthony G., 285,827, Cl. D23-28.000.
Mastro, Louis L.: *See*—
Daily, Terrill A.; and Mastro, Louis L., 285,830, Cl. D23-128.000.
May, William J.: *See*—
Oyler, Thomas; May, William J.; and Beal, Glenn I., 285,828, Cl. D23-34.000.
Medeco Security Locks, Inc.: *See*—
Oliver, Ronald N., 285,772, Cl. D8-341.000.
Mens, Gerardus F. Support for flower pots. 285,755, 9-23-86, Cl. D6-404.000.
Merrill Manufacturing Company: *See*—
Anderson, Stephen J., 285,824, Cl. D23-12.000.
Anderson, Stephen J., 285,825, Cl. D23-12.000.
Milling, Cynthia. Table. 285,760, 9-23-86, Cl. D6-486.000.
Minolta Camera Kabushiki Kaisha: *See*—
Moggridge, William G., 285,793, Cl. D14-100.000.
Moebius, Wolfgang; and Reisinger, Peter, to Porsche AG. Open sport car. 285,783, 9-23-86, Cl. D12-92.000.
Moggridge, William G., to Minolta Camera Kabushiki Kaisha. Keyboard housing assembly. 285,793, 9-23-86, Cl. D14-100.000.
Monark AB: *See*—
Berntsson, Tommy, 285,816, Cl. D21-194.000.
Moore, Lewis B. Golf putter head. 285,818, 9-23-86, Cl. D21-219.000.
Morgan, Paul E., to CTI International. Ventilator for cargo container. 285,834, 9-23-86, Cl. D23-151.000.

Munson, Robert J., to General Motors Corporation. Vehicle wheel cover. 285,786, 9-23-86, Cl. D12-210.000.

Neckel, Edmund, to Valco Cincinnati, Inc. Air actuated glue valve. 285,826, 9-23-86, Cl. D23-19.000.

Nederman, Bill P. P. Fume extractor arm. 285,832, 9-23-86, Cl. D23-139.000.

Nilsson, Erik W.: *See*—
Brunnegard, Ake; Nilsson, Erik W.; and Ring, Hans, 285,798, Cl. D15-143.000.

Nishida, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Bank note wrapper. 285,857, 9-23-86, Cl. D99-28.000.

North American Philips Corp.: *See*—
Rapp, Harold B.; and Towne, Herbert, 285,788, Cl. D13-30.000.

Oates, William J. Carrying case for a weighted exercise bar or the like. 285,746, 9-23-86, Cl. D3-36.000.

Ogasawara, Takeo, to Kowa Company Ltd. Terrestrial telescope. 285,802, 9-23-86, Cl. D16-132.000.

Oliver, Ronald N., to Medeco Security Locks, Inc. Dead-bolt lock. 285,772, 9-23-86, Cl. D8-341.000.

Ooki, Takeo, to Sakai & Co., Ltd. Coin holder. 285,858, 9-23-86, Cl. D99-34.000.

Ooki, Takeo, to Sakai & Co., Ltd. Coin tray. 285,859, 9-23-86, Cl. D99-34.000.

Otsuka, Hiroshi, to Seiko Epson Corporation. Electronic printer. 285,807, 9-23-86, Cl. D18-13.000.

Owens-Illinois, Inc.: *See*—
Kretz, Edward J., 285,776, Cl. D9-401.000.

Oyler, Thomas; May, William J.; and Beal, Glenn I., to Gilmour Manufacturing Co. Foam nozzle. 285,828, 9-23-86, Cl. D23-34.000.

Pace Industries Inc.: *See*—
Palka, James J., 285,761, Cl. D6-561.000.

Palka, James J., to Pace Industries Inc. Wall mounted cabinet. 285,761, 9-23-86, Cl. D6-561.000.

Pendelfin Studios Limited: *See*—
Heap, Jean W., 285,782, Cl. D11-157.000.

Persson, Anders, to Aktiebolaget Bygg-och Transportekonomi (BT) Div. Nike Hydraulics. Vehicle service jack. 285,854, 9-23-86, Cl. D34-31.000.

Persson, Anders, to Aktiebolaget Bygg-och Transportekonomi Division Nike Hydraulics. Vehicle service jack. 285,855, 9-23-86, Cl. D34-31.000.

Poon, Tit-Wing. Lantern. 285,840, 9-23-86, Cl. D26-42.000.

Porsche AG: *See*—
Moebius, Wolfgang; and Reisinger, Peter, 285,783, Cl. D12-92.000.

Presto Lock, Inc.: *See*—
Gehrie, Charles S.; and Kloin, Lester G., 285,771, Cl. D8-331.000.

Rapp, Harold B.; and Towne, Herbert, to North American Philips Corp. Electrical outlet. 285,788, 9-23-86, Cl. D13-30.000.

Read, Duncan H. Bird feeder. 285,847, 9-23-86, Cl. D30-14.000.

Rehrig, James B. Plastic bag rack. 285,851, 9-23-86, Cl. D34-6.000.

Reisinger, Peter: *See*—
Moebius, Wolfgang; and Reisinger, Peter, 285,783, Cl. D12-92.000.

Richardson, William E., to Fryerich Putter Company. Golf putter. 285,817, 9-23-86, Cl. D21-218.000.

Richwine, Judith A. Carousel jewelry box. 285,743, 9-23-86, Cl. D3-30.100.

Ring, Hans: *See*—
Brunnegard, Ake; Nilsson, Erik W.; and Ring, Hans, 285,798, Cl. D15-143.000.

Roehrig, Peter. Pacifier. 285,839, 9-23-86, Cl. D24-45.000.

Ronayne, Walter M., to American Home Products Corporation (Del). Adjustable hanger for in-tank toilet cleaning devices. 285,833, 9-23-86, Cl. D23-150.000.

Rotpunkt Dr. Anso Zimmermann: *See*—
Zimmermann, Anso, 285,768, Cl. D7-317.000.

Sadow, Brian D. Inflatable rocking footrest. 285,752, 9-23-86, Cl. D6-349.000.

Sakaguchi, Hiroshi: *See*—
Yubisui, Takahisa; and Sakaguchi, Hiroshi, 285,805, Cl. D18-7.000.

Sakai & Co., Ltd.: *See*—
Ooki, Takeo, 285,858, Cl. D99-34.000.
Ooki, Takeo, 285,859, Cl. D99-34.000.

Samsonite Corporation: *See*—
Feinberg, Martin R.; and Knoepke, Eckhard, 285,748, Cl. D3-48.000.

Satake, Noriko, to Sharp Corporation. Electronic calculator. 285,806, 9-23-86, Cl. D18-7.000.

Schwartz, Frederic W., to Cable Electric Products, Inc. Multiple outlet. 285,787, 9-23-86, Cl. D13-30.000.

Scott & Fetzer Company, The: *See*—
Mariol, James F., 285,749, Cl. D4-115.000.

Seiko Epson Corporation: *See*—
Otsuka, Hiroshi, 285,807, Cl. D18-13.000.

Senmed, Inc.: *See*—
Hunt, John V.; and Spreckelmeier, Lawrence E., 285,836, Cl. D24-26.000.

Sharp Corporation: *See*—
Satake, Noriko, 285,806, Cl. D18-7.000.
Yubisui, Takahisa; and Sakaguchi, Hiroshi, 285,805, Cl. D18-7.000.

Sindler, Philip S. Combined organizer pouch and loose leaf binder. 285,809, 9-23-86, Cl. D19-27.000.

Smith, Christian E. Paint can drip guard. 285,778, 9-23-86, Cl. D9-434.000.

Smith, Donald H.: *See*—
Smith, Hugh; and Smith, Donald H., 285,838, Cl. D28-30.000.

Smith, Douglas W.; and Bonner, Mark N., to Wagner Spray Tech Corporation. Power unit for a paint scraper or similar article. 285,770, 9-23-86, Cl. D8-69.000.

Smith, Hugh; and Smith, Donald H., to Albyn of Stonehaven, Ltd. Comb. 285,838, 9-23-86, Cl. D28-30.000.

Spangler, Anthony G.: *See*—
Hill, Charles P.; and Spangler, Anthony G., 285,827, Cl. D23-28.000.

Spreckelmeier, Lawrence E.: *See*—
Hunt, John V.; and Spreckelmeier, Lawrence E., 285,836, Cl. D24-26.000.

Square D Company: *See*—
Daily, Terrill A.; and Mastro, Louis L., 285,830, Cl. D23-128.000.

Story, William R.: *See*—
Harrison, Michael A.; and Story, William R., 285,790, Cl. D14-53.000.

Takahashi, Akemi; Aoki, Takao; Kiyota, Toru; and Tanaka, Ryuuichirou, to Hitachi, Ltd. Television receiver. 285,791, 9-23-86, Cl. D14-80.000.

Takahashi, Tokuo, to Kawada Co. Ltd. Toy interconnecting adaptor block or the like. 285,813, 9-23-86, Cl. D21-108.000.

Takida, Norio: *See*—
Fuziwara, Seiro; Kobori, Masao; and Takida, Norio, 285,808, Cl. D18-22.000.

Tanaka, Ryuuichirou: *See*—
Takahashi, Akemi; Aoki, Takao; Kiyota, Toru; and Tanaka, Ryuuichirou, 285,791, Cl. D14-80.000.

Thomson Leeds Company Inc.: *See*—
March, David, 285,758, Cl. D6-465.000.

Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 285,841, 9-23-86, Cl. D30-8.000.

Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 285,842, 9-23-86, Cl. D30-8.000.

Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 285,843, 9-23-86, Cl. D30-8.000.

Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 285,844, 9-23-86, Cl. D30-8.000.

Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 285,845, 9-23-86, Cl. D30-8.000.

Tigert, Donald J., to Unique Gifts, Inc. Aquarium. 285,846, 9-23-86, Cl. D30-8.000.

Timarac, Drago. Family tree picture holder. 285,751, 9-23-86, Cl. D6-301.000.

Tirinen, Juha, to Yoko-Team Oy. Glove. 285,742, 9-23-86, Cl. D2-361.000.

Tokyo Electric O., Ltd.: *See*—
Fuziwara, Seiro; Kobori, Masao; and Takida, Norio, 285,808, Cl. D18-22.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Nishida, Yoshiaki, 285,857, Cl. D99-28.000.

Towne, Herbert: *See*—
Rapp, Harold B.; and Towne, Herbert, 285,788, Cl. D13-30.000.

Unique Gifts, Inc.: *See*—
Tigert, Donald J., 285,841, Cl. D30-8.000.
Tigert, Donald J., 285,842, Cl. D30-8.000.
Tigert, Donald J., 285,843, Cl. D30-8.000.
Tigert, Donald J., 285,844, Cl. D30-8.000.
Tigert, Donald J., 285,845, Cl. D30-8.000.
Tigert, Donald J., 285,846, Cl. D30-8.000.

Valco Cincinnati, Inc.: *See*—
Neckel, Edmund, 285,826, Cl. D23-19.000.

Vercon, Inc.: *See*—
MacLaughlin, Donald N., 285,774, Cl. D9-389.000.
MacLaughlin, Donald N., 285,775, Cl. D9-389.000.

Vinot, Jean-Pierre R. P. Contact lens case. 285,744, 9-23-86, Cl. D3-34.000.

Wagner Spray Tech Corporation: *See*—
Smith, Douglas W.; and Bonner, Mark N., 285,770, Cl. D8-69.000.

Waldron, William K. Trash bag holder and dispenser. 285,850, 9-23-86, Cl. D34-6.000.

Walker Telecommunications Corporation: *See*—
Karlin, James, 285,789, Cl. D14-53.000.

Warner-Lambert Company: *See*—
Wittwer, Fritz, 285,837, Cl. D28-2.000.

Warnke, Robert L. Coal ash separator. 285,831, 9-23-86, Cl. D23-131.000.

Warrington Inc.: *See*—
Bourque, Rene, 285,819, Cl. D21-225.000.
Bourque, Rene, 285,820, Cl. D21-225.000.

Watanabe, Chokichi. Seaweed plate garnish for a sushi or sashimi dish and the like. 285,740, 9-23-86, Cl. D1-122.000.

Westall, John R. Window shroud for recreational vehicles and van conversions. 285,785, 9-23-86, Cl. D12-183.000.

Westvaco Corporation: *See*—
Forbes, Hampton E., Jr., 285,777, Cl. D9-416.000.

Wilhoit, William H.: *See*—
Davis, Michael; and Wilhoit, William H., 285,747, Cl. D3-48.000.

Winegard Company: *See*—
Winegard, John R.; and Cowan, Keith B., 285,792, Cl. D14-90.000.

Winegard, John R.; and Cowan, Keith B., to Winegard Company. Satellite dish antenna support rib. 285,792, 9-23-86, Cl. D14-90.000.

Wittwer, Fritz, to Warner-Lambert Company. Pharmaceutical capsule. 285,837, 9-23-86, Cl. D28-2.000.

Wright, Donald; and Wright, Randall J. Level rule. 285,780, 9-23-86, Cl. D10-62.000.

Wright, Randall J.: *See*—
Wright, Donald; and Wright, Randall J., 285,780, Cl. D10-62.000.
Wright, Viloes G. Video game cabinet. 285,759, 9-23-86, Cl. D6-467.000.
Xerox Corporation: *See*—
Cathey, Wayne C., 285,804, Cl. D18-2.000.
Yamada, Teruo, to Fuji Mfg. Co. Ltd. Heat sealing machine. 285,799, 9-23-86, Cl. D15-146.000.
Yoko-Team Oy: *See*—
Tirinen, Juha, 285,742, Cl. D2-361.000.
Yubisui, Takahisa; and Sakaguchi, Hiroshi, to Sharp Corporation. Electronic calculator. 285,805, 9-23-86, Cl. D18-7.000.
Zieff, Mark P., to Dart Industries Inc. Ice bucket or the like. 285,765, 9-23-86, Cl. D7-78.000.
Zieff, Mark P., to Dart Industries. Ice bucket with closure or the like. 285,766, 9-23-86, Cl. D7-78.000.
Zieff, Mark P., to Dart Industries. Ice bucket or the like. 285,767, 9-23-86, Cl. D7-78.000.
Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmermann. Insulated pitcher or the like. 285,768, 9-23-86, Cl. D7-317.000.
Zola, Colman. Chair. 285,753, 9-23-86, Cl. D6-373.000.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 23, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

68 4,612,672
114 4,612,673
406 4,612,674
424 4,612,675

CLASS 4

300.3 4,612,676

CLASS 5

12 R 4,612,677
82 R 4,612,678
425 4,612,679

CLASS 8

111 4,613,332
115.7 4,613,333
442 4,613,334
477 4,613,335
494 4,613,336
543 4,613,337

CLASS 14

22 4,612,680

CLASS 15

49 R 4,612,681

CLASS 17

26 4,612,682
4,612,683
45 4,612,684

CLASS 23

301 4,613,338

CLASS 24

67.9 4,612,685
71.1 4,612,686
574 4,612,687

CLASS 28

104 4,612,688

CLASS 29

25.42 4,612,689
33 P 4,612,690
33 R 4,612,691
116 AD 4,612,692
251 4,612,693
450 4,612,694
505 4,612,695
564.4 4,612,696
564.6 4,612,700
568 4,612,697
572 4,612,698
576 W 4,612,701
596 4,612,702
739 4,612,699
885 4,612,703

CLASS 30

47 4,612,704
53 4,612,705
160 4,612,706
162 4,612,707
260 4,612,708

CLASS 33

125 R 4,612,709

CLASS 34

16 4,612,710
39 4,612,711
68 4,612,712

CLASS 36

44 4,612,713
136 4,612,714

CLASS 37

92 4,612,715
103 4,612,716

CLASS 38

104 4,612,717

CLASS 40

21 C 4,612,718
21 R 4,612,719
211 4,612,720
310 4,612,721

CLASS 43

3 4,612,722
61 4,612,723
73 4,612,724

CLASS 44

1 D 4,613,339
53 4,613,340
57 4,613,341
62 4,613,342
71 4,613,343

CLASS 47

58 4,612,725
66 4,612,726

CLASS 48

77 4,613,344

CLASS 49

62 4,612,727
193 4,612,728
362 4,612,729

CLASS 51

3 4,612,730
56 R 4,612,731
101 LG 4,612,732
119 4,612,733
170 PT 4,612,734
217 R 4,612,735
284 E 4,612,736
293 4,613,345
310 4,612,737
335 4,612,738

CLASS 52

1 4,612,739
36 4,612,740
79.4 4,612,741
169.5 4,612,742
208 4,612,743
220 4,612,744
4,612,745
221 4,612,746
250 4,612,747
309.16 4,612,748
561 4,612,749
638 4,612,750
723 4,612,751

CLASS 53

377 4,612,752
398 4,612,753
457 4,612,754
485 4,612,755
579 4,612,756

CLASS 55

4 4,613,346
53 4,613,347
318 4,613,348
458 4,613,349

CLASS 56

10.2 4,612,757
310 4,612,758

CLASS 57

17 4,612,759
105 4,612,760
4,612,761
301 4,612,762
4,612,763
401 4,612,764

CLASS 59

7 4,612,765

CLASS 60

261 4,612,766
321 4,612,767
506 4,612,768
521 4,612,769
602 4,612,770
611 4,612,771

CLASS 62

3 4,612,772
50 4,612,773
59 4,612,774
126 4,612,775
175 4,612,776
247 4,612,777
311 4,612,778
344 4,612,779
381 4,612,780
457 4,612,781
500 4,612,782
528 4,612,783

CLASS 65

2 4,613,350
22 4,613,351
158 4,613,352
163 4,613,353

CLASS 66

9 R 4,612,784
25 4,612,785
121 4,612,786

CLASS 70

358 4,612,787

CLASS 71

73 4,613,354
86 4,613,355
94 4,613,356
4,613,357
100 4,613,358
122 4,613,359
124 4,613,360

CLASS 72

13 4,612,788
71 4,612,789
96 4,612,790
98 4,612,791
183 4,612,792
311 4,612,793
410 4,612,794
478 4,612,795
481 4,612,796

CLASS 73

40.5 R 4,612,797
40.7 4,612,798
54 4,612,799
4,612,800
64.1 4,612,801
73 4,612,802
81 4,612,803
113 4,612,804
150 A 4,612,805
195 4,612,806
580 4,612,807
622 4,612,808
626 4,612,809
705 4,612,810
706 4,612,811
718 4,612,812
861.25 4,612,813
861.72 4,612,814
864.11 4,612,815

CLASS 74

5.46 4,612,819
401 4,612,816
424.8 NA 4,612,817
467 4,612,818
475 4,612,820
483 PB 4,612,821
493 4,612,822
533 4,612,823
665 F 4,612,824
711 4,612,825
863 4,612,826
866 4,612,827
4,612,828
876 4,612,829

CLASS 75

0.5 B 4,613,362
2 4,613,361
10.62 4,613,363
34 4,613,364
83 4,613,365
84.5 4,613,366
246 4,613,368
4,613,369
248 4,613,370
255 4,613,371

CLASS 81

63.2 4,612,830

CLASS 82

1.4 4,612,831
3 4,612,832
18 4,612,833
19 4,612,834

CLASS 83

24 4,612,842
500 4,612,835
729 4,612,836
864 4,612,837

CLASS 84

1.01 4,612,838
4,612,839
269 4,612,840
484 4,612,841

CLASS 89

33.04 4,612,843

CLASS 91

363 A 4,612,844
448 4,612,845
457 4,612,846

CLASS 92

13.1 4,612,847

CLASS 98

50 4,612,848

CLASS 99

277.1 4,612,849
289 R 4,612,850
419 4,612,851
450.4 4,612,852
461 4,612,853
579 4,612,854

CLASS 100

5 4,612,855
189 B1 4,132,164

CLASS 101

129 4,612,856

CLASS 102

204 4,612,857
245 4,612,858
476 4,612,859
518 4,612,860

CLASS 104

166 4,612,861

CLASS 105

340 4,612,862

CLASS 106

1.13 4,613,372
18.3 4,613,373
118 4,613,374
281 R 4,613,375
282 4,613,376

CLASS 108

28 4,612,863

CLASS 109

49.5 4,612,864

CLASS 110

244 4,612,865

CLASS 111

6 B1 3,964,405

CLASS 112

155 4,612,866
314 4,612,867

CLASS 114

39 4,612,868
293 4,612,869
311 4,612,870

CLASS 116

202 4,612,871
218 4,612,872

CLASS 118

52 4,612,873
410 4,612,874
670 4,612,875

CLASS 119

5 4,612,876
156 4,612,877

CLASS 122

15 4,612,878
235 F 4,612,879

CLASS 123

1 A 4,612,880
27 GE 4,612,881
44 R 4,612,882
90.13 4,612,883
90.16 4,612,884
90.27 4,612,885
190 B 4,612,886
198 F 4,612,887
261 4,612,888
299 4,612,898
339 4,612,889
373 4,612,890
4,612,891
413 4,612,899
425 4,612,900
4,612,901
4,612,902
432 4,612,903
438 4,612,892
447 4,612,893
492 4,612,904
494 4,612,894
4,612,895
557 4,612,896
4,612,897
575 4,612,905

CLASS 124

24 R 4,612,906
35 A 4,612,907

CLASS 126

200 4,612,908
299 D 4,612,909
360 R 4,612,910
369 4,612,911
400 4,612,912
438 4,612,913
4,612,914

CLASS 127

39 4,613,377

CLASS 128

1 R 4,612,915
4,612,916
33 4,612,917
69 4,612,918
77 4,612,919
92 A 4,612,921
92 BA 4,612,920
92 EB 4,612,922
92 R 4,612,923
130 4,612,924
133 4,612,925
200.21 4,612,926
200.26 4,612,927
204.23 4,612,928
204.25 4,612,929
303 B 4,612,930
328 4,612,931
334 R 4,612,932
4,612,933
421 4,612,934
510 4,612,935
644 4,612,936
663 4,612,937
665 4,612,938
774 4,612,939
804 4,612,940

CLASS 130

27 R 4,612,941

CLASS 131

276 4,612,942
329 4,612,943

CLASS 132

11 R 4,612,944
137 4,612,945

CLASS 134

2 4,613,378
7 4,613,379
30 4,613,380
62 4,612,946
104 4,612,947

CLASS 135

112 4,612,948

CLASS 137

2 4,612,949
116.5 4,612,950
209 4,612,951
212 4,612,952
327 4,612,953
360 4,612,954
375 4,612,955
386 4,612,956
543.17 4,612,962
565 4,612,957
801 4,612,958
828 4,612,959
846 4,612,960

CLASS 138

93 4,612,961

CLASS 140

105 4,612,963

CLASS 141

68 4,612,964
114 4,612,965

CLASS 144

366 4,612,966

CLASS 148

1.5 4,613,381
4,613,382
6.14 R 4,613,384
12 B 4,613,385
13 4,613,386
171 4,613,387
425 4,613,388

CLASS 150

52 K 4,612,967

CLASS 156

143 4,613,389
177 4,613,390
213 4,613,391
235 4,613,392
323 4,613,393
345 4,613,394
378 4,613,395
391 4,613,396
476 4,613,397
628 4,613,398
634 4,613,399
643 4,613,400
4,613,401
4,613,402
4,613,403
4,613,404

CLASS 159

13.3 4,613,405

CLASS 162

49 4,613,406
175 4,613,407

CLASS 164

34 4,612,968
122.2 4,612,969
416 4,612,970
454 4,612,971
465 4,612,972
508 4,612,973

CLASS 165

10 4,612,974
43 4,612,975
70 4,612,976
71 4,612,977
104.33 4,612,978
129 4,612,979
158 4,612,980
4,612,981
166 4,612,982

CLASS 166

55 4,612,983
77 4,612,984
114 4,612,985
171 4,612,986
212 4,612,987
248 4,612,988

263 4,612,989
272 4,612,990
273 4,612,991
297 4,612,992
335 4,612,993
344 4,612,994

CLASS 172

7 4,612,995
26 4,612,996
776 4,612,997

CLASS 173

19 4,612,998
109 4,612,999
163 4,613,000

CLASS 174

30 4,613,727
53 4,613,728

CLASS 175

52 4,613,001
107 4,613,002
324 4,613,003
371 4,613,004
4,613,005

CLASS 179

8 A 4,613,729
81 R 4,613,730
170.2 4,613,731
178 4,613,732

CLASS 180

9.25 4,613,006
89.15 4,613,007
196 M 4,613,020
247 4,613,008
253 4,613,009
261 4,613,011

CLASS 181

178 4,613,012

CLASS 182

20 4,613,013

CLASS 184

1.5 4,613,014

CLASS 188

6 4,613,015
52 4,613,016
71.7 4,613,017
72.4 4,613,018
73.31 4,613,019
218 XL 4,613,021

CLASS 192

3.29 4,613,022
8 R 4,613,023
18 A 4,613,024
70.18 4,613,025
85 AA 4,613,026
89 B 4,613,027
98 4,613,028
106.2 4,613,029
4,613,030

CLASS 198

399 4,613,031
409 4,613,032
457 4,613,033
465.1 4,613,034
509 4,613,035
633 4,613,036
778 4,613,037

CLASS 200

5 R 4,613,733
144 R 4,613,734
158 4,613,735
317 4,613,736
340 4,613,737

CLASS 202

84 4,613,408

CLASS 203

10 4,613,409
39 4,613,410
67 4,613,411
91 4,613,412

CLASS 204

33 4,613,413
70 4,613,414
98 4,613,415
4,613,416
129.85 4,613,417
243 R 4,613,418
299 R 4,613,419
412 4,613,420
4,613,421
419 4,613,422

CLASS 206

216 4,613,038
287.1 4,613,039
315.1 4,613,040
373 4,613,041
419 4,613,042
428 4,613,043
444 4,613,044
470 B1 4,469,226
512 4,613,045
622 4,613,046

CLASS 208

65 4,613,423
4,613,424
89 4,613,425
107 4,613,426
111 4,613,427
113 4,613,428

CLASS 209

5 4,613,429
167 4,613,430
169 4,613,431
254 4,613,432

CLASS 210

150 4,613,433
151 4,613,434
169 B1 4,501,659
222 4,613,435
232 4,613,436
315 4,613,437
323.1 4,613,438
396 B1 3,984,329
471 4,613,439
490 4,613,440
500.36 4,613,441

CLASS 211

55 4,613,047
71 4,613,048
88 4,613,049

CLASS 215

11 B 4,613,050
225 4,613,051
252 4,613,052

CLASS 219

10.55 B 4,613,739
10.55 R 4,613,738
64 Re.32,251
69 W 4,613,740
73.2 4,613,741
121 LG 4,613,742
130.21 4,613,743
200 4,613,744
297 4,613,745
490 4,613,746

CLASS 220

22 4,613,053
88 R 4,613,054
210 4,613,055

CLASS 221

211 4,613,056
265 4,613,057

CLASS 222

36 4,613,058
52 4,613,059
61 4,613,060
82 4,613,061
146.2 4,613,062
153 4,613,063
456 4,613,064

CLASS 223

37 4,613,065
66 4,613,066

CLASS 224

150 4,613,067
242 4,613,068

CLASS 228

211 4,613,069
231 4,613,070

CLASS 235

480 4,613,747

CLASS 237

9 R 4,613,071
12.3 C 4,613,072
12.3 R 4,613,073

CLASS 239

1 4,613,074
3 4,613,075
4,613,076
97 4,613,077
390 4,613,078
462 4,613,079
542 4,613,080
585 4,613,081
690 4,613,082
707 4,613,083

CLASS 241

16 4,613,084
82.5 4,613,085
101 B 4,613,086
111 4,613,087
197 4,613,088

CLASS 242

18 A 4,613,090
18 DD 4,613,089
35.5 A 4,613,091
46.4 4,613,092
55 4,613,093
86.52 4,613,094
198 4,613,095

CLASS 244

1 R 4,613,096
B1 4,089,491
12.4 4,613,097
46 4,613,098
53 R 4,613,099
122 AD 4,613,100
122 R 4,613,101
134 A 4,613,102

CLASS 246

473 A 4,613,103

CLASS 248

97 4,613,104
178 4,613,105
405 4,613,106
481 4,613,107
497 4,613,108
553 4,613,109

CLASS 249

141 4,613,110

CLASS 250

201 4,613,748
202 4,613,749
223 R 4,613,750
4,613,751
227 4,613,752
236 4,613,753
252.1 4,613,754
282 4,613,755
361 R 4,613,756
458.1 4,613,757
474.1 4,613,758
566 4,613,759

CLASS 251

46 4,613,111
149.6 4,613,112

CLASS 252

1 4,613,442
21 4,613,443
70 4,613,444
75 4,613,445
91 4,613,446
4,613,447
157 4,613,448
174.17 4,613,449
181 4,613,450
182 4,613,451
186.23 4,613,452
301.6 P 4,613,453
313.2 4,613,454
389.1 Re.32,250
516 4,613,455
522 R 4,613,456
4,613,457

CLASS 260

384 4,613,464
394 4,613,465
543 F 4,613,467
550 4,613,468

CLASS 261

41 B 4,613,469

CLASS 264

22 4,613,470
40.1 4,613,471
42 4,613,472
103 4,613,473
320 4,613,474
328.1 4,613,475

CLASS 266

83 4,613,113

CLASS 267

9 R 4,613,114
64.25 4,613,115
4,613,116
140.1 4,613,117
4,613,118
172 4,613,119

CLASS 269

71 4,613,120
322 4,613,121
4,613,122

CLASS 271

16 4,613,124
18.3 4,613,123
227 4,613,125
267 4,613,126
274 4,613,127

CLASS 272

8 M 4,613,128
73 4,613,129
135 4,613,130
146 4,613,131

CLASS 273

1.5 R 4,613,135
4,613,136
63 R 4,613,137
73 E 4,613,138
148 B 4,613,139
158 4,613,132
195 B 4,613,133
242 4,613,134

CLASS 277

3 4,613,140
27 4,613,141
81 R 4,613,142
134 4,613,143

CLASS 280

91 4,613,144
158 A 4,613,145
260 4,613,010
281 B 4,613,146
473 4,613,147
491 E 4,613,148
508 4,613,149
615 4,613,150
650 4,613,151
669 4,613,152
689 4,613,153
707 4,613,154
760 4,613,155
821 4,613,156

CLASS 283

1 R 4,613,157

CLASS 285

3 4,613,158
4,613,159
18 4,613,160
4,613,161
27 4,613,162
4,613,163
4,613,164
45 4,613,165
53 4,613,166
54 4,613,167
150 4,613,168
161 4,613,169
187 4,613,170
197 4,613,171
340 4,613,172

CLASS 289

17 4,613,173

CLASS 290

1 C 4,613,760
36 R 4,613,761
44 4,613,762
4,613,763

CLASS 292

136 4,613,174
148 4,613,175
201 4,613,176

CLASS 293

120 4,613,177
128 4,613,178

CLASS 294

19.1 4,613,179
82.34 4,613,180

CLASS 296

100 4,613,181
181 4,613,182
183 4,613,183
187 4,613,184

CLASS 297

39 4,613,185
83 4,613,186
195 4,613,187
250 4,613,188

CLASS 303

6 C 4,613,189
109 4,613,190

CLASS 307

116 4,613,764
252 A 4,613,766
252 K 4,613,765
288 4,613,767
350 4,613,768
4,613,770
351 4,613,769
443 4,613,771
4,613,772
4,613,773
463 4,613,774
480 4,613,775
490 4,613,776
591 4,613,777

CLASS 310

90 4,613,778
112 4,613,779
216 4,613,780
239 4,613,781
323 4,613,782
353 4,613,783
358 4,613,784

CLASS 313

405 4,613,785
528 4,613,786
579 4,613,787

CLASS 315

39.61 4,613,788
58 4,613,789
72 4,613,790
82 4,613,791
97 4,613,792
169.3 4,613,793
169.4 4,613,794
205 4,613,795
219 4,613,796
241 R 4,613,797

CLASS 318

160 4,613,798
314 4,613,799
434 4,613,800
440 4,613,801
483 4,613,802
568 4,613,803
587 4,613,804
687 4,613,805
696 4,613,806
807 4,613,807

CLASS 322

99 4,613,808

CLASS 323

268 4,613,809
271 4,613,810

CLASS 324

58.5 B 4,613,812
72 4,613,813
77 B 4,613,814
96 4,613,811
233 4,613,815
248 4,613,816
4,613,817
306 4,613,818
308 4,613,819
318 4,613,820
323 4,613,821
426 4,613,822

CLASS 330

289 4,613,823
302 4,613,824

CLASS 331

4 4,613,825
14 4,613,826
20 4,613,827
47 4,613,828
59 4,613,829
65 4,613,830
78 4,613,831
96 4,613,832

CLASS 333

24 R 4,613,833
120 4,613,834
159 4,613,835
4,613,836
219 4,613,837
232 4,613,838
239 4,613,839

CLASS 335

128 4,613,840

CLASS 336

83 4,613,841
218 4,613,842
232 4,613,843

CLASS 338

314 4,613,844

CLASS 339

14 P 4,613,192
14 R 4,613,191
17 L 4,613,193
19 4,613,194
31 R 4,613,195
97 P 4,613,196
99 R 4,613,197
141 4,613,198
177 R 4,613,199

CLASS 340

52 R 4,613,845
106 4,613,846
114 R 4,613,847
541 4,613,848
679 4,613,849
686 4,613,850
688 4,613,851
703 4,613,852
710 4,613,853
714 4,613,854
718 4,613,855
723 4,613,856
724 4,613,857
825.44 4,613,859
825.5 4,613,858
825.57 4,613,860
825.73 4,613,861

CLASS 343

17.1 PF 4,613,862
17.7 4,613,863
357 4,613,864
417 4,613,865
448 4,613,866
458 4,613,867
700 MS 4,613,868
768 4,613,869
915 4,613,870

CLASS 346

1.1 4,613,871
4,613,872
33 R 4,613,873
74.6 4,613,874
140 R 4,613,875
160 4,613,876
4,613,877
204 4,613,878
209 4,613,879

CLASS 350

3.7 4,613,200
6.1 4,613,201
6.4 4,613,202
6.6 4,613,203
96.14 4,613,204
96.25 4,613,205
174 4,613,206
331 R 4,613,207
349 4,613,208
350 S 4,613,209
356 4,613,210
357 4,613,211
432 4,613,212
4,613,213
511 4,613,214
604 4,613,215
618 4,613,216

CLASS 351

176 4,613,217
206 4,613,218
209 4,613,219

CLASS 352

78 R 4,613,220

CLASS 354

321 4,613,221
4,613,222
322 4,613,223
402 4,613,224
403 4,613,225

CLASS 355

10 4,613,226
14 C 4,613,227
14 R 4,613,228
15 4,613,229
53 4,613,230

CLASS 356

5 4,613,231
124 4,613,232
328 4,613,233
394 4,613,234
446 4,613,235

CLASS 357

2 4,613,880
22 4,613,881
23.3 4,613,882
23.4 4,613,883
39 4,613,884
42 4,613,885
4,613,886
43 4,613,887
54 4,613,888

4,613,889
67 4,613,890
68 4,613,891
75 4,613,892

CLASS 358

11 4,613,893
13 4,613,894
41 4,613,895
76 4,613,896
80 4,613,897
87 4,613,898
88 4,613,899
122 4,613,901
123 4,613,900
124 4,613,902
141 4,613,903
142 4,613,904
167 4,613,905
183 4,613,906
257 4,613,907
310 4,613,908
4,613,909
4,613,910

CLASS 360

3 4,613,911
19.1 4,613,912
51 4,613,913
70 4,613,914
77 4,613,915
78 4,613,916
97 4,613,917
113 4,613,918
118 4,613,919
121 4,613,920
133 4,613,921

CLASS 361

215 4,613,922
315 4,613,923
403 4,613,924
420 4,613,925

CLASS 362

32 4,613,926
4,613,927
88 4,613,928
150 4,613,929
223 4,613,930
373 4,613,931

CLASS 363

54 4,613,932
55 4,613,933
131 4,613,934

CLASS 364

200 4,613,935
4,613,936
413 4,613,937
420 4,613,938
424 4,613,939
490 4,613,940
4,613,941
513 4,613,269
4,613,942
4,613,943
513.5 4,613,944
518 4,613,945
4,613,946
526 4,613,947
4,613,948
527 4,613,949
569 4,613,950
4,613,951
578 4,613,952
900 4,613,953
4,613,954

CLASS 365

27 4,613,955
185 4,613,956
189 4,613,957
4,613,958
200 4,613,959

CLASS 367

51 4,613,960
102 Re.32,252

CLASS 368

165 4,613,236

CLASS 369

44 4,613,961
4,613,962
4,613,963
45 4,613,964
59 4,613,965
100 4,613,966
221 4,613,967
270 4,613,968

CLASS 370

58 4,613,969

CLASS 371

25 4,613,970

CLASS 372

87 4,613,971
107 4,613,972

CLASS 374

162 4,613,237
174 4,613,238

CLASS 375

37 4,613,973
4,613,974
40 4,613,975
52 4,613,976
97 4,613,977
99 4,613,978
108 4,613,979
116 4,613,980

CLASS 376

249 4,613,476
258 4,613,477
290 4,613,478
416 4,613,479

CLASS 378

34 4,613,981
37 4,613,982
99 4,613,983
185 4,613,984

CLASS 381

51 4,613,985

CLASS 382

54 4,613,986
65 4,613,987

CLASS 383

8 4,613,988

CLASS 384

580 4,613,239
585 4,613,240

CLASS 400

121 4,613,241
124 4,613,242
4,613,243
175 4,613,244
313 4,613,245
320 4,613,246
486 4,613,247
697.1 4,613,248

CLASS 403

3 4,613,249
11 4,613,250
135 4,613,251

CLASS 405

76 4,613,252
195 4,613,253
259 4,613,254
286 4,613,255
299 4,613,256
302 4,613,257
303 4,613,258

CLASS 406

14 4,613,259

CLASS 408

74 4,613,260

CLASS 409

137 4,613,261
211 4,613,262

CLASS 410

32 4,613,263

CLASS 411

55 4,613,264
83 4,613,265

CLASS 412

40 4,613,266

CLASS 414

37 4,613,267
114 4,613,268
276 4,613,270
303 4,613,271
347 4,613,272
463 4,613,273
473 4,613,274
489 4,613,275
542 4,613,276
729 4,613,277
736 4,613,278

CLASS 415

2 A 4,613,279
17 4,613,280
170 B 4,613,281

CLASS 416

36 4,613,282

CLASS 417

68 4,613,283
76 4,613,284
214 4,613,285
216 4,613,286
330 4,613,287
407 4,613,288
420 4,613,289
517 4,613,290

CLASS 418

15 4,613,291
61 B 4,613,292

CLASS 419

30 4,613,480

CLASS 420

42 4,613,367

CLASS 422

16 4,613,481
51 4,613,482
131 4,613,483
132 4,613,484
173 4,613,485
310 4,613,486

CLASS 423

244 4,613,487
328 4,613,488
342 4,613,489
344 4,613,490
347 4,613,491
359 4,613,492
489 4,613,493
490 4,613,494
508 4,613,495

CLASS 424

14 4,613,496
44 4,613,497
59 4,613,499
80 4,613,505
89 4,613,501
94 4,613,502
117 4,613,503
154 4,613,498
195.1 4,613,504

CLASS 425

371 4,613,293
438 4,613,294
542 4,613,295
547 4,613,296

CLASS 426

18 4,613,506
28 4,613,507
281 4,613,508
283 4,613,509
535 4,613,510
4,613,511
548 4,613,512
607 4,613,514
651 4,613,513

CLASS 427

1 4,613,515
2 4,613,516
4,613,517
38 4,613,518
39 4,613,519
128 4,613,520
169 4,613,521
202 4,613,522
220 4,613,523
243 4,613,524
256 4,613,525
356 4,613,526
412 4,613,527
421 4,613,528

CLASS 428

15 4,613,529
34 4,613,530
35 4,613,531
36 4,613,532
4,613,533
40 Re.32,249
57 4,613,534
113 4,613,535
124 4,613,536
192 4,613,537
198 4,613,538
210 4,613,539
212 4,613,540
4,613,541
290 4,613,542
304.4 4,613,543
315.5 4,613,544
328 4,613,545
336 4,613,546
349 4,613,547
411.1 4,613,548
469 4,613,549

CLASS 429

53 4,613,550
85 4,613,500
194 4,613,551
224 4,613,552

CLASS 430

2 4,613,553
39 4,613,554
45 4,613,555
57 4,613,556
59 4,613,557
84 4,613,558
137 4,613,559
286 4,613,560
326 4,613,561
450 4,613,562
523 4,613,563
549 4,613,564
4,613,565

CLASS 431

16 4,613,297
88 4,613,298
116 4,613,299
153 4,613,300
259 4,613,301
263 4,613,302
346 4,613,303
354 4,613,304

CLASS 432

253 4,613,305
264 4,613,306

CLASS 433

166 4,613,307
173 4,613,308

CLASS 434

170 4,613,309

CLASS 435

6 4,613,566
7 4,613,567
23 4,613,568
26 4,613,569
99 4,613,570
130 4,613,571
215 B1 4,495,285
253 4,613,572
289 4,613,573

CLASS 436

2 4,613,574
106 4,613,575
548 4,613,576

CLASS 440

76 4,613,310

CLASS 441

130 4,613,311

CLASS 445

25 4,613,312
28 4,613,313
4,613,314

CLASS 446

355 4,613,315

CLASS 455

33 4,613,990
351 4,613,989

CLASS 464

85 4,613,316
131 4,613,317

CLASS 474

74 4,613,318
80 4,613,319

CLASS 493

198 4,613,320
342 4,613,321

CLASS 501

35 4,613,577

CLASS 502

64 4,613,578
115 4,613,579
117 4,613,580
127 4,613,581
185 4,613,582
252 4,613,583
304 4,613,584
355 4,613,585

CLASS 514

13 4,613,586
19 4,613,587
23 4,613,588
4,613,589
4,613,590
34 4,613,591
63 4,613,592
106 4,613,593
167 4,613,594
195 4,613,595
210 4,613,596
211 4,613,597
4,613,598
234 4,613,599
242 4,613,603
252 4,613,600
4,613,601
4,613,602
274 4,613,604
294 4,613,605
307 4,613,606
314 4,613,607
357 4,613,608
396 4,613,609
406 4,613,610
443 4,613,611
456 4,613,612
461 4,613,613
469 4,613,614
478 4,613,615
507 4,613,616
521 4,613,617
538 4,613,618
546 4,613,619
570 4,613,620
693 4,613,621
718 4,613,622

CLASS 518

700 4,613,623
715 4,613,624

CLASS 521

53 4,613,625
60 4,613,626
68 4,613,627
72 4,613,628
82 4,613,629
134 4,613,630

CLASS 523

130 4,613,631
172 4,613,632
201 4,613,633
223 4,613,634

CLASS 524

14 4,613,635
83 4,613,636
105 4,613,637
109 4,613,638
251 4,613,639
264 4,613,640
267 4,613,641
349 4,613,642
426 4,613,643
430 4,613,644
443 4,613,645
476 4,613,646
514 4,613,647
555 4,613,648
650 4,613,649
828 4,613,650

CLASS 525

42 4,613,651
276 4,613,652
352 4,613,653
537 4,613,654

CLASS 526

114 4,613,655
193 4,613,656
204 4,613,657
312 4,613,658

CLASS 528

15 4,613,659
73 4,613,660
108 4,613,661
137 4,613,662
266 4,613,663
274 4,613,664

CLASS 530

351 4,613,458
4,613,459

CLASS 536

20 4,613,665

CLASS 540

94 4,613,463
310 4,613,462
608 4,613,461

CLASS 544

277 4,613,666

CLASS 546

14 4,613,667
44 4,613,668
167 4,613,669

CLASS 549

211 4,613,670
274 4,613,671
399 4,613,672

CLASS 556

100 4,613,673

CLASS 558

161 4,613,674
170 4,613,675

CLASS 560

39 4,613,676
41 4,613,460
61 4,613,677
4,613,682
67 4,613,683
92 4,613,678
179 4,613,684
190 4,613,679
205 4,613,680
236 4,613,681
330 4,613,685
335 4,613,686
344 4,613,466
359 4,613,687

CLASS 562

401 4,613,688
4,613,689
4,613,690
443 4,613,691
495 4,613,692
517 4,613,693
590 4,613,694

CLASS 564

33 4,613,695
67 4,613,696
4,613,697
409 4,613,705
412 4,613,698
418 4,613,704

CLASS 568

15 4,613,699
322 4,613,706
435 4,613,700
454 4,613,701
490 4,613,702
640 4,613,703
819 4,613,710
864 4,613,707

CLASS 570

136 4,613,708
227 4,613,709

CLASS 585

10 4,613,712
241 4,613,713
271 4,613,714
411 4,613,711
412 4,613,715
415 4,613,716
467 4,613,717
500 4,613,718
528 4,613,719
640 4,613,720
643 4,613,721
651 4,613,722
730 4,613,723
824 4,613,724
828 4,613,725
861 4,613,726

CLASS 604

6 4,613,322
43 4,613,323
49 4,613,324
65 4,613,325
89 4,613,326
141 4,613,327
156 4,613,328
158 4,613,329
890 4,613,330

CLASS 623

61 4,613,331

D1—	122	285,740		465	285,758		416	285,777		132	285,797		219	285,818	D28—	2	285,837
D2—	185	285,815		467	285,759		434	285,778		143	285,798		225	285,819		30	285,838
	232	285,741		486	285,760	D10—	30	285,779		146	285,799			285,820	D30—	8	285,841
	361	285,742		561	285,761		62	285,780	D16—	31	285,800		233	285,821			285,842
D3—	30.1	285,743		575	285,856	D11—	6	285,781		102	285,801	D22—	140	285,823			285,843
	34	285,744	D7—	5	285,762		157	285,782		132	285,802	D23—	12	285,824			285,844
	35	285,745		19	285,763	D12—	92	285,783	D18—	2	285,803			285,825			285,845
	36	285,746			285,764		183	285,785			285,804		19	285,826			285,846
	48	285,747		78	285,765		193	285,784		7	285,805		28	285,827		14	285,847
		285,748			285,766		210	285,786			285,806		34	285,828	D32—	17	285,848
	101	285,822			285,767	D13—	30	285,787		13	285,807		72	285,829	D34—	1	285,849
D4—	115	285,749		317	285,768			285,788		22	285,808		128	285,830		6	285,850
	136	285,750	D8—	31	285,769	D14—	53	285,789	D19—	27	285,809		131	285,831			285,851
D6—	301	285,751		69	285,770			285,790	D20—	10	285,810		139	285,832		21	285,852
	349	285,752		331	285,771		80	285,791	D21—	62	285,811		150	285,833			285,853
	373	285,753		341	285,772		90	285,792		82	285,812		151	285,834		31	285,854
	403	285,754		380	285,773		100	285,793		108	285,813	D24—	10	285,835			285,855
	404	285,755	D9—	389	285,774		114	285,794		141	285,814		26	285,836	D99—	28	285,857
	405	285,756			285,775		115	285,795		194	285,816		45	285,839		34	285,858
	450	285,757		401	285,776	D15—	123	285,796		218	285,817	D26—	42	285,840			285,859

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,613,494	4,613,123	4,613,935	4,613,213	4,612,920	4,613,661
	4,613,768	4,613,131	4,613,940	4,613,253	4,612,947	4,613,710
02 :	4,612,917	4,613,146	4,613,951	4,613,263	4,613,042	4,613,728
04 :	4,612,741	4,613,152	4,613,954	4,613,391	4,613,063	4,613,783
	4,612,778	4,613,190	4,613,972	4,613,396	4,613,183	4,613,796
	4,612,815	4,613,198	4,613,981	4,613,415	4,613,600	4,613,816
	4,612,949	4,613,207	08 : 4,612,906	4,613,498	4,613,620	4,613,921
	4,612,978	4,613,211	4,613,250	4,613,640	4,613,770	4,613,938
	4,613,180	4,613,215	4,613,519	4,613,772	4,613,780	4,613,978
	4,613,181	4,613,288	4,613,868	4,613,802	19 : 4,613,475	26 : Re.32,250
	4,613,435	4,613,297	4,613,953	4,613,937	4,613,762	4,612,690
	4,613,735	4,613,330	09 : 4,612,724	13 : 4,612,775	20 : 4,613,099	4,612,693
	4,613,825	4,613,332	4,612,816	4,613,078	4,132,164	4,612,707
	4,613,858	4,613,338	4,612,972	4,613,379	21 : 4,613,323	4,612,748
	4,613,969	4,613,356	4,613,130	4,613,521	4,613,523	4,612,798
	4,613,974	4,613,357	4,613,134	14 : 4,613,287	22 : 4,612,753	4,612,820
05 :	4,613,273	4,613,385	4,613,196	15 : 4,612,685	4,612,854	4,612,823
	4,613,274	4,613,388	4,613,259	17 : 4,612,751	4,612,984	4,612,826
06 :	4,612,672	4,613,400	4,613,280	4,612,765	4,613,341	4,612,878
	4,612,675	4,613,432	4,613,283	4,612,767	4,613,423	4,612,897
	4,612,677	4,613,436	4,613,321	4,612,772	4,613,424	4,612,910
	4,612,696	4,613,439	4,613,353	4,612,942	4,613,548	4,613,087
	4,612,710	4,613,495	4,613,412	4,612,954	4,613,642	4,613,094
	4,612,717	4,613,530	4,613,462	4,613,005	4,613,705	4,613,139
	4,612,725	4,613,574	4,613,471	4,613,015	23 : 4,613,392	4,613,169
	4,612,737	4,613,586	4,613,473	4,613,056	24 : 4,612,702	4,613,171
	4,612,797	4,613,606	4,613,516	4,613,062	4,612,860	4,613,177
	4,612,809	4,613,637	4,613,540	4,613,220	4,613,103	4,613,186
	4,612,811	4,613,675	4,613,582	4,613,266	4,613,179	4,613,240
	4,612,868	4,613,723	4,613,677	4,613,270	4,613,189	4,613,249
	4,612,872	4,613,756	4,613,691	4,613,291	4,613,378	4,613,340
	4,612,880	4,613,759	4,613,936	4,613,428	4,613,538	4,613,380
	4,612,896	4,613,764	4,613,945	4,613,440	4,613,668	4,613,386
	4,612,914	4,613,769	10 : 4,613,520	4,613,449	4,613,810	4,613,437
	4,612,925	4,613,771	4,613,539	4,613,454	4,613,836	4,613,444
	4,612,928	4,613,774	4,613,560	4,613,476	4,613,862	4,613,463
	4,612,937	4,613,790	4,613,578	4,613,542	4,613,904	4,613,503
	4,612,939	4,613,792	4,613,635	4,613,570	4,613,927	4,613,524
	4,612,952	4,613,793	4,613,636	4,613,580	25 : 4,612,678	4,613,534
	4,612,964	4,613,797	4,613,648	4,613,589	4,612,698	4,613,630
	4,612,967	4,613,809	4,613,720	4,613,590	4,612,703	4,613,659
	4,612,986	4,613,839	4,613,984	4,613,707	4,612,733	4,613,671
	4,612,987	4,613,847	11 : 4,613,755	4,613,718	4,612,768	4,613,678
	4,612,998	4,613,848	12 : 4,612,673	4,613,730	4,612,940	4,613,682
	4,613,000	4,613,863	4,612,718	4,613,732	4,612,971	4,613,733
	4,613,003	4,613,865	4,612,806	4,613,808	4,612,973	4,613,739
	4,613,038	4,613,869	4,612,870	4,613,861	4,613,036	4,613,746
	4,613,055	4,613,870	4,612,930	4,613,892	4,613,316	4,613,806
	4,613,066	4,613,874	4,612,934	4,613,934	4,613,459	4,613,843
	4,613,068	4,613,876	4,613,136	4,613,979	4,613,468	4,613,846
	4,613,080	4,613,901	4,613,187	18 : 4,612,796	4,613,482	27 : Re.32,249
	4,613,104	4,613,913	4,613,193	4,612,825	4,613,522	4,612,755
	4,613,109	4,613,933	4,613,199	4,612,919	4,613,566	4,612,812

4,612,886
4,612,965
4,613,058
4,613,151
4,613,194
4,613,292
4,613,345
4,613,350
4,613,544
4,613,550
4,613,627
4,613,738
28 : 4,613,658
29 : 4,612,679
4,612,714
4,612,739
4,612,783
4,612,857
4,612,962
4,613,047
4,613,067
4,613,069
4,613,112
4,613,129
4,613,137
4,613,195
4,613,328
4,613,329
4,613,409
30 : 4,613,504
31 : 4,612,912
4,613,855
33 : 4,612,730
4,613,242
4,613,767
4,613,798
34 : 4,612,821
4,612,831
4,612,852
4,612,923
4,612,959
4,612,969
4,613,128
4,613,209
4,613,269
4,613,322
4,613,326
4,613,343
4,613,348
4,613,417
4,613,422
4,613,448
4,613,497
4,613,499
4,613,510
4,613,511
4,613,535
4,613,543
4,613,594
4,613,609
4,613,610
4,613,645
4,613,699
4,613,706
4,613,712
4,613,713

4,613,829
4,613,832
4,613,844
4,613,851
4,613,854
4,613,891
4,613,941
4,613,948
4,613,955
4,613,987
4,613,990
4,089,491
4,501,659
35 : 4,613,629
4,613,765
4,613,811
36 : 4,612,744
4,612,799
4,612,856
4,612,882
4,612,908
4,612,916
4,612,944
4,612,945
4,612,953
4,613,039
4,613,070
4,613,076
4,613,155
4,613,156
4,613,197
4,613,238
4,613,247
4,613,279
4,613,281
4,613,284
4,613,313
4,613,314
4,613,324
4,613,325
4,613,363
4,613,368
4,613,369
4,613,398
4,613,402
4,613,445
4,613,480
4,613,501
4,613,507
4,613,512
4,613,513
4,613,515
4,613,518
4,613,547
4,613,552
4,613,556
4,613,557
4,613,561
4,613,576
4,613,611
4,613,623
4,613,634
4,613,651
4,613,689
4,613,690

4,613,743
4,613,775
4,613,795
4,613,812
4,613,815
4,613,820
4,613,828
4,613,841
4,613,845
4,613,867
4,613,877
4,613,882
4,613,895
4,613,903
4,613,916
4,613,928
4,613,930
4,613,931
4,613,942
4,613,958
4,613,966
4,613,988
4,469,226
37 : 4,612,752
4,613,065
4,613,106
4,613,149
4,613,277
4,613,327
4,613,517
4,613,915
39 : 4,612,681
4,612,686
4,612,715
4,612,721
4,612,742
4,612,864
4,612,875
4,612,926
4,612,933
4,612,960
4,613,012
4,613,017
4,613,020
4,613,045
4,613,051
4,613,052
4,613,059
4,613,079
4,613,082
4,613,083
4,613,102
4,613,143
4,613,157
4,613,173
4,613,192
4,613,200
4,613,204
4,613,219
4,613,260
4,613,304
4,613,320
4,613,342
4,613,483
4,613,528

4,613,656
4,613,660
4,613,662
4,613,670
4,613,711
4,613,742
4,613,745
4,613,779
4,613,813
4,613,871
4,613,939
4,613,989
40 : 4,612,711
4,612,723
4,612,814
4,612,915
4,612,980
4,612,991
4,613,048
4,613,135
4,613,140
4,613,159
4,613,161
4,613,182
4,613,303
4,613,311
4,613,372
4,613,410
4,613,438
4,613,484
4,613,715
4,613,719
4,613,722
4,613,821
4,613,980
41 : 4,612,918
4,613,086
4,613,300
4,613,339
4,613,408
4,613,814
4,613,856
4,613,875
4,613,886
4,613,950
42 : 4,612,691
4,612,699
4,612,700
4,612,746
4,612,757
4,612,781
4,612,834
4,612,848
4,612,855
4,612,861
4,612,935
4,613,016
4,613,037
4,613,057
4,613,115
4,613,120
4,613,132
4,613,176
4,613,191
4,613,309

4,613,360
4,613,367
4,613,371
4,613,374
4,613,411
4,613,429
4,613,430
4,613,431
4,613,451
4,613,453
4,613,478
4,613,479
4,613,481
4,613,487
4,613,533
4,613,551
4,613,624
4,613,638
4,613,784
4,613,785
4,613,932
44 : 4,613,553
4,613,604
45 : 4,612,840
4,612,907
4,613,043
4,613,333
47 : 4,612,842
4,613,049
48 : 4,612,706
4,612,722
4,612,738
4,612,774
4,612,776
4,612,779
4,612,780
4,612,800
4,612,876
4,612,922
4,612,943
4,612,955
4,612,983
4,612,985
4,612,988
4,612,990
4,612,992
4,612,993
4,612,997
4,613,002
4,613,004
4,613,077
4,613,096
4,613,160
4,613,162
4,613,163
4,613,164
4,613,165
4,613,175
4,613,237
4,613,290
4,613,349
4,613,358
4,613,394
4,613,443
4,613,446

4,613,509
4,613,631
4,613,653
4,613,663
4,613,673
4,613,679
4,613,701
4,613,703
4,613,741
4,613,754
4,613,801
4,613,849
4,613,885
4,613,889
4,613,952
4,613,956
4,613,959
4,613,960
49 : 4,613,302
4,613,331
4,613,366
4,613,469
4,613,485
4,613,804
4,613,860
4,613,973
50 : 4,612,735
4,612,805
4,613,040
4,613,866
51 : 4,613,041
4,613,752
4,613,946
53 : 4,612,676
4,612,701
4,612,713
4,612,844
4,613,101
4,613,114
4,613,262
4,613,406
4,613,572
4,613,800
4,613,831
3,964,405
54 : 4,613,527
4,613,616
4,613,617
4,613,721
55 : 4,612,827
4,612,883
4,612,996
4,613,046
4,613,110
4,613,145
4,613,170
4,613,174
4,613,294
4,613,646
4,613,763
4,613,818
4,613,926
4,613,949
56 : 4,612,851
4,612,877

DESIGN PATENTS

01 : 285,801
04 : 285,818
06 : 285,790
285,793
285,794
285,809
285,822
285,851
08 : 285,778
285,792
285,814
10 : 285,777
12 : 285,750
17 : 285,756

285,761
285,797
285,810
18 : 285,827
19 : 285,824
285,825
20 : 285,785
24 : 285,743
285,852
25 : 285,765
285,766
285,767
285,815
26 : 285,751

285,774
285,775
285,781
285,786
285,831
285,850
34 : 285,757
285,764
285,770
285,771
285,795
285,833
285,834
36 : 285,745

285,748
285,752
285,753
285,758
285,760
285,762
285,763
285,779
285,784
285,788
285,789
285,796
285,803
37 : 285,817

39 : 285,749
285,776
285,812
285,826
285,836
285,849
40 : 285,754
285,769
42 : 285,747
285,828
44 : 285,787
45 : 285,746
48 : 285,759
285,773

285,804
285,821
285,830
285,841
285,842
285,843
285,844
285,845
285,846
51 : 285,772
285,847
54 : 285,811
55 : 285,780

U.S. GOVERNMENT PRINTING OFFICE : O—1986

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

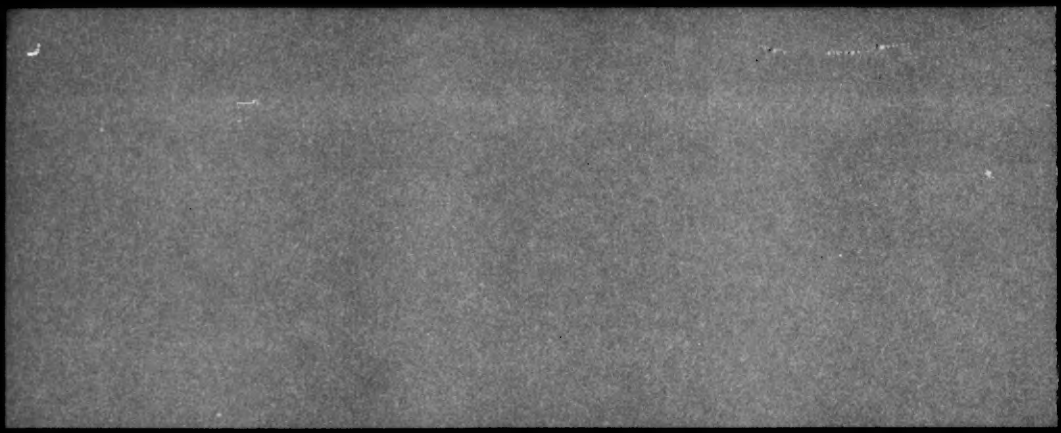
PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402



U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*